Access DB# 122387

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Raymond Alejandro Examiner #: 76895 Date: 05/17/04
Art Unit: 1745 Phone Number 30(571)272-1282 Serial Number: 09/863503
Mail Box and Bldg/Room Location: Rem 6B59 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Protective Membrane-Equipped Composite Electrolyte, Method for Producing the same & Fuel Cell Provided with the same.

Inventors (please provide full names): Inventor: Hiroshi Akita

Earliest Priority Filing Date: 05/23/01; 5/26/00 -JP

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

US2002004165

Please, search for subject matter of claims 7-12.

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STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher: J. Calvo	NA Sequence (#)	STN
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#)	Questel/Orbit
Date Searcher Picked Up: 5/24/04	Bibliographic	Dr Link
Date Completed: 5/24/04	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 120	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time: 120	Other	Other (specify)

PTO-1590 (8-01)

AMENDMENTS TO THE CLAIMS

Please cancel claims 1-6 and 13-19 and amend claim 7, as set forth in the following listing of claims, which replaces all prior listings, and versions, of claims in the present application.

Listing of Claims

1. (CANCELED)
2. (CANCELED)
3. (CANCELED)
4. (CANCELED)
5. (CANCELED)
6. (CANCELED)

7. (CURRENTLY AMENDED) A fuel cell provided with a cell unit comprising an electrolyte-electrode joined unit including a protective membrane-equipped composite electrolyte, wherein said protective membrane-equipped composite electrolyte, ~~which is composed of~~ is fonned by initially impregnating a matrix ~~impregnated~~ with a liquid electrolyte, and thereafter, coating the entire ~~and which has a~~ surface ~~coated~~ of said matrix with a crosslinked polymer membrane, said protective membrane-equipped composite electrolyte being interposed between an anode electrode and a cathode electrode each having a gas diffusion layer and an electrode catalyst layer stacked on said gas diffusion layer and

wherein said crosslinked polymer membrane is produced in a chemical reaction between a crosslinkable polymer deposited onto the entire surface of said matrix impregnated with said liquid electrolyte and a crosslinking agent with each other.

8. (ORIGINAL) The fuel cell according to claim 7, wherein said liquid electrolyte for constructing said protective membrane-equipped composite electrolyte is any one of phosphoric acid, sulfuric acid, and methanesulfonic acid, and said membrane is composed of a basic polymer having a structural unit of monomer of secondary amine.

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=> file hca


FILE 'HCA' ENTERED AT 13:45:18 ON 21 MAY 2004
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
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FILE COVERS 1907 - 20 May 2004 VOL 140 ISS 22
FILE LAST UPDATED: 20 May 2004  (20040520/ED)

  This file contains CAS Registry Numbers for easy and accurate
  substance identification.


=> d his

     (FILE 'HOME' ENTERED AT 12:42:52 ON 21 MAY 2004)

     FILE 'HCA' ENTERED AT 12:43:02 ON 21 MAY 2004
               E US20020004165/PN
L1             1 S E3

     FILE 'LCA' ENTERED AT 12:43:50 ON 21 MAY 2004
L2           671 S CROSSLINK? OR CROSS##(W)LINK?
L3          1793 S MEMBRANE?
L4           539 S FUELCELL? OR BATTERY? OR BATTERIES? OR (FUEL? OR ELECTROCHEM?
L5          1802 S ELECTRODE? OR ANODE? OR CATHODE?
L6          5338 S POLYMER## OR HOMOPOLYMER## OR COPOLYMER## OR TERPOLYMER## OR
L7          3517 S POLYMERIZ? OR POLYMERIS? OR POLYM# OR CROSSLINK? OR CROSS(W)L

     FILE 'HCA' ENTERED AT 12:48:22 ON 21 MAY 2004
L8        251190 S L4
L9        711980 S L5
L10       677455 S L3
L11       125980 S L7(2N)(COMPOUND? OR CHEMICAL### OR AGENT?)
L12       116959 S L8 AND L9
L13         9792 S L12 AND L10
L14           53 S L13 AND L11
L15       244965 S 52/SX,SC
L16           25 S L14 AND L15
L17       208778 S MEMBRAN?/TI
L18            9 S L16 AND L17
L19            9 S L18 AND L7
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L20      372769 S AMINE?
L21           1 S L14 AND L20
                 SEL L1 RN

     FILE 'REGISTRY' ENTERED AT 12:52:59 ON 21 MAY 2004
L22           4 S E1-E4
L23           1 S L22 AND HEXANE,
L24           3 S L22 NOT L23

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L25      144028 S L24
L26        6101 S L23
L27           1 S L16 AND (L25 OR L26)
L28      131628 S (PHOPHOR? OR SULFUR? OR SULPHUR? OR HYDROCLOR?)(2N)ACID?
L29       66284 S ISOCYANATE## OR DICYANATE###
L30      301648 S 72/SX,SC
L31          42 S L14 AND 1907-2000/PY,PRY
L32           2 S L31 AND (L28 OR L29)
L33          28 S L31 AND (L15 OR L30)
L34      429929 S MATRIX? OR MATRIC?
L35      175843 S SOAK###### OR IMPREGNAT?
L36           1 S L33 AND L34
L37           4 S L33 AND L35
L38        2620 S PEM#
L39           5 S L32 OR L36 OR L37
L40          24 S L33 NOT L39

     FILE 'LCA' ENTERED AT 13:02:02 ON 21 MAY 2004

     FILE 'WPIX' ENTERED AT 13:08:26 ON 21 MAY 2004
L41       97021 S L2
L42      130298 S L3
L43      234697 S L4
L44      610160 S L5
L45       60855 S L11
L46       64946 S L17 OR PEM
L47      143470 S L20
L48       44145 S L28
L49       49235 S L29
L50      139235 S L34
L51      123409 S L35

     FILE 'LCA' ENTERED AT 13:10:08 ON 21 MAY 2004

     FILE 'WPIX' ENTERED AT 13:13:50 ON 21 MAY 2004
L52       71509 S L43 AND L44
L53        5187 S L52 AND L42
L54          47 S L53 AND L45
L55           4 S L54 AND (L47 OR L48 OR L49)
L56           7 S L54 AND L50
L57           1 S L56 AND L51
L58         518 S AKITA ?/AU
L59           9 S L55 OR L56 OR L57
L60           1 S L59 AND L58
L61           8 S L59 NOT L60
L62          38 S L54 NOT L59

     FILE 'LCA' ENTERED AT 13:17:33 ON 21 MAY 2004
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     FILE 'WPIX' ENTERED AT 13:18:23 ON 21 MAY 2004
L63          14 S L62 AND 2001-2004/PRD
L64          24 S L62 NOT L63
L65           7 S L64 AND SEPARATOR?
L66          24 S L64 OR L65
L67          24 S L66 NOT L59
L68           6 S L61 AND 2001-2004/PRD
L69           2 S L61 NOT L68

     FILE 'LCA' ENTERED AT 13:22:54 ON 21 MAY 2004

     FILE 'JAPIO' ENTERED AT 13:23:37 ON 21 MAY 2004
L70       38753 S L2
L71       39086 S L3
L72      133811 S L4
L73      467523 S L5
L74       22172 S L11
L75       13251 S L17 OR PEM
L76       32361 S L20
L77       18950 S L28
L78       15101 S L29
L79       59671 S L34
L80       53879 S L35
L81       46459 S L72 AND L73
L82        1782 S L81 AND L71
L83        8957 S L81 AND SEPARATOR#
L84           3 S L82 AND L74
L85          88 S L83 AND L74
L86          62 S L82 AND L7
L87           3 S L86 AND (L76 OR L77 OR L78)
                E AKITA H/AU
L88         200 S E19-E27
L89           6 S L84 OR L87
L90           0 S L89 AND L88
L91           0 S L85 AND L88
L92           0 S L82 AND L88
L93         158 S PROTECTIV?(2N)L71
L94           0 S L85 AND L93
L95           5 S L81 AND L93
L96         242 S L83 AND (L76 OR L77 OR L78)
L97           2 S L79 AND L96
L98          43 S L96 AND L80
L99      468273 S SUBSTRAT###
L100          2 S L98 AND L99
L101     138772 S CATALY? OR ACTIVATOR? OR ACCELERANT? OR ENHANCER? OR ACCELERA
L102       7674 S L101(2N)(COMPOUND# OR COMPD# OR COMP# OR AGENT?)
L103          0 S L86 AND L102
L104          0 S L85 AND L102
L105          2 S L82 AND L102
L106          4 S L83 AND L102
L107        229 S L96 AND ACID
L108         19 S L84 OR L87 OR L89 OR L95 OR L97 OR L100 OR L105 OR L106
L109          5 S L108 AND L93
L110         19 S L108 OR L109
L111          0 S L110 AND 2001-2004/PRY

     FILE 'HCA, WPIX, JAPIO' ENTERED AT 13:43:17 ON 21 MAY 2004
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L112 79 DUP REM L39 L40 L68 L66 L69 L110 (1 DUPLICATE REMOVED)
SET MSTEPS ON

FILE 'WPIX, HCA, JAPIO' ENTERED AT 13:43:55 ON 21 MAY 2004
L113 24 S L112
L114 6 S L112
L115 2 S L112
L116 32 FILE WPIX
L117 5 S L112
L118 24 S L112
L119 29 FILE HCA
L120 18 S L112
L121 18 FILE JAPIO
TOTAL FOR ALL FILES
L122 79 S L112 AND L4

FILE 'HCA' ENTERED AT 13:45:18 ON 21 MAY 2004

=> d L39 1-5 cbib abs hitind

L39 ANSWER 1 OF 5 HCA COPYRIGHT 2004 ACS on STN
136:21972 Method for producing protective **membrane**-equipped composite **electrolyte** for **fuel cell**. Akita, Hiroshi (Honda Giken Kogyo K. K., Japan). Eur. Pat. Appl. EP 1160903 A2 20011205, 18 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-304635 20010525. PRIORITY: JP 2000-157191 20000526.

AB There is provided a protective **membrane**-equipped composite electrolyte which is excellent in water resistance, heat resistance, and liquid electrolyte-holding ability and which is preferred as an electrolyte for a **fuel cell**, a method for producing the same, and a **fuel cell** provided with the same. A composite electrolyte is prepared by **impregnating** a **matrix** with a liquid electrolyte. A crosslinkable polymer is deposited onto a surface of the composite electrolyte together with a **crosslinking agent**. Subsequently, a protective **membrane** composed of crosslinked product is formed by reacting the polymer and the **crosslinking agent** with each other. Accordingly, a protective **membrane**-equipped composite electrolyte is obtained, in which the surface of the composite electrolyte is coated with the protective **membrane** composed of crosslinked product. Alternatively, when the **matrix** is composed of a polymer, the **matrix** itself may be crosslinked. An electrolyte-**electrode** joined unit is prepared by installing the protective **membrane**-equipped composite electrolyte between an **anode electrode** and a **cathode electrode**. Further, separators, collecting **electrodes**, and end plates, are arranged in this order at the outside of the **anode electrode** and the **cathode electrode** resp. to connect the end plates to one another. Thus, a cell unit of a **fuel cell** is constructed.

IC ICM H01M008-10
ICS H01M008-02

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST **fuel cell membrane** equipped composite

electrolyte
IT **Fuel cell electrolytes**
Fuel cells
(method for producing protective **membrane**-equipped composite **electrolyte** for **fuel cell**)
IT Polybenzimidazoles
RL: DEV (Device component use); USES (Uses)
(method for producing protective **membrane**-equipped composite **electrolyte** for **fuel cell**)
IT 75-75-2, Methanesulfonic acid 7664-38-2, Phosphoric acid, uses 7664-93-9, **Sulfuric acid**, uses
RL: DEV (Device component use); USES (Uses)
(method for producing protective **membrane**-equipped composite **electrolyte** for **fuel cell**)
IT 822-06-0P, Hexamethylene diisocyanate
RL: SPN (Synthetic preparation); PREP (Preparation)
(method for producing protective **membrane**-equipped composite **electrolyte** for **fuel cell**)

L39 ANSWER 2 OF 5 HCA COPYRIGHT 2004 ACS on STN
117:131238 pipropel, a method for its preparation by electrochemical reductive coupling of bis(pyridine) and its use as **crosslinking agent**. Drtina, Gary J.; Christensen, Lief (Minnesota Mining and Manufacturing Co., USA). PCT Int. Appl. WO 9209603 A1 **19920611**, 25 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1991-US7496 19911015. PRIORITY: US 1990-620258 19901130.
AB Polycyclic diamines (I; Y = CH2, S, O, NR3; R1-3 = alkyl, alkylene, H) are claimed. I have a basic framework similar to [3.3.3]propellane. I are useful as chain extenders, **crosslinking agents**, and curing agents in various polymer systems. A process for the preparation of I
comprises the electroreductive coupling of bis(pyridine) compds. An **electrochem. cell** equipped with lead **electrodes** and a cation exchange **membrane** was charged with 4,4'-trimethylenebis(pyridine) (25 g) and 0.95M **sulfuric acid** (400 mL) and a current of 12 A was passed through the cell to give pipropel I (Y = CH2; R1 = R2 = H). Azapipropel I (Y = NH; R1 = R2 = H) and oxapipropel I (Y = O; R1 = R2 = H) were prepared similarly. Coupling of pipropel with glyoxal gave the corresponding aminal II and its isomer. A mixture of pipropel and Epon 828 was maintained at ambient conditions to give a light yellow glass.
IC ICM C07D471-22
ICS C07D495-22; C07D491-22; C07F007-10; C07F009-645; C07F009-6509; C25B003-04; C25B003-10; C08K005-3437
CC 28-23 (Heterocyclic Compounds (More Than One Hetero Atom))
Section cross-reference(s): 27, 35
ST electrochem redn coupling bispyridine; polyurethane crosslinking pipropel; polyurea crosslinking pipropel; pipropel **crosslinking agent** chain extender; oxapipropel **crosslinking agent** chain extender; azapipropel **crosslinking agent** chain extender; epoxy resin crosslinking pipropel
IT Resins
RL: RCT (Reactant); RACT (Reactant or reagent)
(pipropel as **crosslinking agent** for)
IT **Crosslinking agents**
(pipropel, azapipropel, and oxapipropel)
IT 75-13-8DP, Isocyanic acid, esters, polymers, reaction products with

polyether-polyamines and pipropel 4098-71-9DP, reaction products with Jeffamine DU 700 and pipropel 25068-38-6DP, Epon 828, reaction products with pipropel 70407-16-8DP, Jeffamine DU 700, reaction products with isophorone **isocyanate** and pipropel 143098-90-2P, N,N'-Diisopropylpipropel 143098-91-3P, N,N'-Isopropylidenepipropel 143098-92-4P 143098-93-5P 143098-94-6P 143098-95-7P, N,N'-Diacetylpipropel 143098-96-8P, N,N'-Cyclopentylidenepipropel 143098-97-9P 143098-98-0P 143098-99-1P 143099-00-7P 143099-01-8P 143167-67-3P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

1T 143098-87-7P, Pipropel 143098-88-8P, Azapipropel 143098-89-9P, Oxapipropel
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as **crosslinking agent** and polymer chain extender)

L39 ANSWER 3 OF 5 HCA COPYRIGHT 2004 ACS on STN
108:41131 **Fuel cells** with ion-exchange **membrane** electrolyte. Iwaasa, Shuzo; Shimizu, Toshio; Doi, Ryota; Yasukawa, Saburo; Yamaguchi, Motoo; Tsukui, Tsutomu (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 62195855 A2 **19870828** Showa, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1986-37856 19860222.

AB Ion-exchange **membranes** having polymer acid layer formed on their surfaces by graft polymerization are used as **fuel cell electrolyte**, and the catalyst layers of the **electrodes** are **impregnated** with solns. containing sulfonic group. Thus, Pt black catalyst layers on C **electrodes** were moistened with solution of Nafion and dried. A Selemion CMV **membrane** was polished and treated with aqueous mixture of Na styrenesulfonate, (NH4)2S2O8, and a **crosslinking agent** to form a grafted gel layer, which was converted to H form to form an electrolyte layer. **Fuel cells** using the above **electrodes** and electrolyte layer were easy to assemble and showed smaller output-voltage decrease than a control cell.

IC ICM H01M008-02
ICS H01M008-10

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST **fuel cell electrode** Nafion **impregnation**; ion exchanger **electrolyte fuel cell**

IT Cation exchangers
(**electrolytes**, for **fuel cells**)

IT **Fuel cells**
(**electrolytes**, ion-exchange **membrane** covered with graft polymerized polymer acid for)

IT **Electrodes**
(**fuel-cell**, catalytic, platinum, Nafion-**impregnated**)

IT 31175-20-9, Nafion
RL: USES (Uses)
(**electrodes impregnated** with, platinum catalytic, for **fuel cells**)

IT 7440-06-4, Platinum, uses and miscellaneous
RL: USES (Uses)
(**electrodes**, catalytic, Nafion-**impregnated**, for

fuel cells)
IT 112284-51-2
RL: USES (Uses)
(**electrolyte**, for **fuel cells**)

L39 ANSWER 4 OF 5 HCA COPYRIGHT 2004 ACS on STN
103:223225 Air **battery**. Sasaki, Kunihiko; Nakamura, Toshiaki (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 60133658 A2 **19850716** Showa, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1983-240993 19831222.
AB An air-**battery cathode** contains ≥1 **gelling agent** selected from CMC [9004-32-4], poly(acrylic acid), Na polyacrylate, and poly(vinyl alc.). Addition of **gelling agent**(s) prevents **impregnation** of the electrolyte into the **cathode** and maintains the 3-phase interface at the **cathode** for long time. Thus, a sheet-form air **cathode** was prepared from active carbon 75, PTFE dispersion 20, and CMC 5%, and Ag oxide catalyst. The sheet was pressed with the collector and bonded with hydrophobic FEP **membrane**. Button-type air-Zn **battery** using this **cathode** showed 6 leakage cases through the **cathode** after 2 mo storage at 25°, and 3, after 50% discharging, each out of 10 **batteries**. All of the 10 control **batteries** without CMC showed leakages under the same conditions.
IC ICM H01M004-86
ICS H01M012-06
CC **72-3** (Electrochemistry)
ST **battery** air **cathode gelling agent**; CMC air **battery cathode**; silver oxide CMC air **cathode**
IT **Cathodes**
(**battery**, catalytic, air silver oxide, containing CMC)
IT 9004-32-4
RL: PRP (Properties)
(**cathodes** containing, air silver oxide catalytic, for **batteries**)
IT 11113-88-5
RL: PRP (Properties)
(**cathodes**, air catalytic, containing CMC, for **batteries**)

L39 ANSWER 5 OF 5 HCA COPYRIGHT 2004 ACS on STN
96:182380 Positive-ion exchanging **membrane**. (Kanegafuchi Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 56082823 A2 **19810706** Showa, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1979-160942 19791211.
AB A cation-exchange **membrane** is prepared by reacting a fluoropolymer **membrane** containing a CF2SO2Br group with an olefinic compound to produce a CO2H group at 0-130° in the presence of 0.001-10 weight% (on olefinic **compound**) **polymerization** inhibitors: quinones, Fe2+ salts, S, or diphenylpicrylhydrazyl. Thus, a Nafion 114 **membrane** (ion-exchange capacity 0.91 mequiv/g dry resin, thickness 100 μ) was converted to the NH4 salt and **soaked** in 1:1 PCl5-POCl3 at 120° for 48 h to convert the sulfonic acid groups to sulfonyl chloride. The **membrane** was treated with a KI solution (100 g KI, 500 mL MeOH, 500 mL H2O) overnight at 60°, 3% Br water at 5° for 8 h, and F2C:CFCH2CH2Br [10493-44-4] containing 0.1% hydroquinone at 80° for 8 h. It was further treated in methanolic KOH at

60° for 20 h, and in a H2SO4 solution of KMnO4 at 100° for 20 h to obtain a **membrane** with CO2H groups. Using this **membrane**, a 4 cm + 10 cm **electrolytic cell** was prepared with a mild steel expanded metal **anode**, a Ru oxide-coated Ti expanded-metal **cathode** (with 3N NaCl), distance between **electrodes** 2 mm, and a pressure differential across the **membrane** of 30 mm. Electrolysis was performed by passing 9.4 A while maintaining the anodic exiting solution (NaOH) concentration at 30%. The cell had interterminal voltage 4.0 V, NaOH preparation current efficiency 95%, and NaCl impurities in NaOH 48 ppm (on 100% NaOH).

IC C08J005-22
ICA B01J047-12
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 49, **72**
ST fluoropolymer cation exchange **membrane**; **electrolysis cell** ion exchange **membrane**; sodium hydroxide manuf **electrolysis cell**
IT **Electrolytic cells**
(fluoropolymer cation-exchange **membranes** for)
IT Fluoropolymers
RL: USES (Uses)
(ion-exchange **membranes**, with carboxy functionality, for **electrolysis cells**)
IT Cation exchangers
(**membranes**, fluoropolymer, with carboxy functionality, for **electrolysis cells**, preparation of)
IT 10493-44-4D, reaction products with fluoropolymer sulfonyl bromide, oxidized 71538-47-1D, brominated, reaction products with olefinic compds., oxidized
RL: USES (Uses)
(ion-exchange **membranes**, with carboxy functionality, for **electrolysis cells**)

=> d L40 1-24 cbib abs hitind

L40 ANSWER 1 OF 24 HCA COPYRIGHT 2004 ACS on STN
136:121079 Polymer **electrolyte fuel cells** and their manufacture. Takebe, Yasuo; Hosaka, Masato; Gyoten, Hisaaki; Uchida, Makoto; Shinkura, Junji; Hato, Kazuhito; Kanbara, Teruhisa (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002025564 A2 20020125, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-204718 20000706.

AB The **fuel cells** contain polymer **electrolyte membranes** sandwiched between a pair of **electrodes** having catalyst layers containing C-supported catalysts, polymer electrolytes, and elec. conductive polymers prepared by polymerization of monomers selected from pyrrole, thiophene, aniline, dihalogenated benzene, dihalogenated thiophene, and dihalogenated pyridine. The manufacturing process includes **chemical** or electrolytic **polymerization** of the monomers in the catalyst mixts. and application of the mixts. on porous **electrodes** to form the catalyst layers. Th C-supported catalysts are coated with the elec. conductive polymers to achieve high catalytic efficiency and high performance of the **fuel cells**.

IC ICM H01M004-96

ICS H01M004-88; H01M008-02; H01M008-10
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 67
ST conducting polymer **electrolyte fuel cell** catalyst; carbon catalyst polymer **electrolyte fuel cell**
IT Catalysts
(electrocatalysts; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, Nafion; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT Conducting polymers
(ionic; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT Catalyst supports
Fuel cell electrodes
Fuel cell electrolytes
Polymer electrolytes
Solid state **fuel cells**
(polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT Polyanilines
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT Ionic conductors
(polymeric; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, Nafion; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, Nafion; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(catalyst support; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT 7440-06-4, Platinum, uses 390761-63-4, TEC 10E50E
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(catalyst; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)
IT 291280-30-3, TGP-H 120
RL: DEV (Device component use); USES (Uses)
(**electrode**; polymer **electrolyte fuel cells** having C-supported catalyst layers containing elec. conductive polymers)

IT 163294-14-2, Nafion 112
RL: DEV (Device component use); USES (Uses)
(polymer **electrolyte fuel cells** having
C-supported catalyst layers containing elec. conductive polymers)
IT 25233-30-1P, Polyaniline 25233-34-5P, Polythiophene 30604-81-0P, Polypyrrole 73061-85-5P, 2,5-Dibromothiophene homopolymer 113814-61-2P, Dibromobenzene homopolymer 183025-63-0P 390739-10-3P 390750-16-0P
RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(polymer **electrolyte fuel cells** having
C-supported catalyst layers containing elec. conductive polymers)

L40 ANSWER 2 OF 24 HCA COPYRIGHT 2004 ACS on STN
136:72307 Separation of carbon dioxide from water/fuel-mixtures in **fuel cells**. Preidel, Walter (Siemens Ag, Germany).
Ger. DE 10040086 C1 20020110, 4 pp. (German). CODEN: GWXXAW.
APPLICATION: DE 2000-10040086 20000816.
AB The CO2 is separated from a water/fuel-mixture in a **fuel cell** comprising a **membrane** electrolyte assembly, which contains a methanol- and H2O-permeable polymer **membrane**. The separation device is part of the entire **fuel cell** system and the **anode** liquid circulates through the proton-conducting **membrane**. Preferably a water/methanol-mixture is fed to the **cathode** and a CO2-enriched liquid is retained at the **anode**. The remaining CO2-enriched liquid is separated in a gas separator to gas and
H2O. The proton-conducting **membrane** having a equivalent weight of <120, especially <110 and is based on a polyperfluoroalkylsulfonic acid material.
IC ICM B01D061-42
ICS H01M008-04
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST carbon dioxide sepn water **fuel cell**; direct methanol **fuel cell**; fluoropolymer nafion **membrane**
carbon dioxide sepn
IT Perfluoro **compounds**
RL: TEM (Technical or engineered material use); USES (Uses)
(alkanesulfonic acids, **polymerized**; **membrane** material for separation of carbon dioxide from water/fuel-mixts. in **fuel cells**)
IT Sulfonic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(alkanesulfonic, perfluoro, polymerized; **membrane** material for separation of carbon dioxide from water/fuel-mixts. in **fuel cells**)
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**membrane** material for separation of carbon dioxide from water/fuel-mixts. in **fuel cells**)
IT **Fuel cell** separators
Fuel cells
(separation of carbon dioxide from water/fuel-mixts. in **fuel cells**)
IT 67-56-1P, Methanol, preparation 7732-18-5P, Water, preparation
RL: PUR (Purification or recovery); PREP (Preparation)

(separation of carbon dioxide from water/fuel-mixts. in **fuel cells**)

IT 124-38-9P, Carbon dioxide, preparation
RL: PUR (Purification or recovery); REM (Removal or disposal); PREP (Preparation); PROC (Process)
(separation of carbon dioxide from water/fuel-mixts. in **fuel cells**)

L40 ANSWER 3 OF 24 HCA COPYRIGHT 2004 ACS on STN
135:360177 Procedure for the separation of carbon dioxide from a fuel/water mixture and an associated device. Preidel, Walter (Siemens A.-G., Germany). Ger. DE 10039960 C1 20011108, 4 pp. (German). CODEN: GWXXAW. APPLICATION: DE 2000-10039960 20000816.

AB The invention separates carbon dioxide from a water/fuel mixture in a **fuel cell** according to the principle of electroosmosis. The separation device is part of the entire **fuel cell** system and the **anode** fluid circulates through a proton conducting **membrane** consisting of a polyperfluoroalkylsulfonic acid material. Methanol and water is extracted to a **cathode** and a carbon enriched fluid is retained by the **anode**. The separation device separates the carbon enriched fluid with a gas separator and the formed **cathode** fluid is reclaimed as a water/methanol mixture

IC ICM B01D061-42
ICS H01M008-04

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST electroosmosis carbon dioxide sepn methanol water **fuel cell**; direct methanol **fuel cell** carbon dioxide sepn

IT Perfluoro **compounds**
RL: TEM (Technical or engineered material use); USES (Uses)
(alkane sulfonates; **polymerized**; **membrane** material; device and electroosmosis procedure for separation of carbon dioxide from fuel/water mixture in a **fuel cell**)

IT Sulfonates
RL: TEM (Technical or engineered material use); USES (Uses)
(alkanesulfonates, perfluoro; polymerized; **membrane** material; device and electroosmosis procedure for separation of carbon dioxide from fuel/water mixture in a **fuel cell**)

IT Electroosmosis
Fuel cells
(device and electroosmosis procedure for separation of carbon dioxide from fuel/water mixture in a **fuel cell**)

IT 67-56-1P, Methanol, preparation 7732-18-5P, Water, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(device and electroosmosis procedure for separation of carbon dioxide from fuel/water mixture in a **fuel cell**)

IT 124-38-9P, Carbon dioxide, preparation
RL: PUR (Purification or recovery); REM (Removal or disposal); PREP (Preparation); PROC (Process)
(device and electroosmosis procedure for separation of carbon dioxide from fuel/water mixture in a **fuel cell**)

L40 ANSWER 4 OF 24 HCA COPYRIGHT 2004 ACS on STN
135:333350 Solid **electrolyte fuel cells** and

their manufacture. Yasuda, Isamu; Matsuzaki, Yoshio; Uratani, Miyuki (Tokyo Gas Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001307750 A2 20011102, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-124444 20000425.

AB The **fuel cells** have an **anode** serving as a substrate plate, an electrolyte layer on the **anode**, and a **cathode** on the electrolyte layer; where a Ce1-xMxO2-δ (M = Ca, Y, Sm, Gd, La, Mg, Sc, Nd, Yb, Pr, Pb, Sr, Eu, Dy, Ba, and/or Be; x ≤0.5) **membrane** between the electrolyte layer and the **cathode**, and the **cathode** is composed of (A1-aBa)(C1-bDb)O3+δ (A = La, Y, Sm, Gd, Pr, and/or Ca; B = Sr, Ba, and/or Ca; C = Mn, Co and/or Ce; D = Cr, Ni, Mn, Zr, Ce, Fe, and/or Al; a ≤0.50; b ≤0.50) having average particle diameter 0.1-20 μm surrounded by 0.5-60% Ce1-x'M'x'O2-δ (M' = Ca, Y, Sm, Gd, La, Mg, Sc, Nd, Yb, Pr, Pb, Sr, Eu, Dy, Ba, and/or Be; x' ≤0.5) having average particle diameter 0.1-5 μm. The **fuel cells** are prepared by forming the Ce1-xMxO2-δ **membrane** on the electrolyte layer, adding a solution of organic compds. of Ce and M' to powdered (A1-aBa)(C1-bDb)O3+δ to form a slurry, condensation **polymg**. the organic **compds**. in the slurry by hydrolysis, applying the mixture on the Ce1-xMxO2-δ **membrane**, and heating and firing to form the **cathode**.

IC ICM H01M008-02
ICS H01M008-02; H01M004-86; H01M008-12

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST solid **electrolyte fuel cell** structure manuf; substituted ceria electrolyte **cathode** interface **fuel cell**

IT **Fuel cell cathodes**
(**cathodes** containing cobalt iron lanthanum strontium oxide particles surrounded by doped ceria particles for solid **electrolyte fuel cells**)

IT Solid state **fuel cells**
(structure and manufacture of solid **electrolyte fuel cells** containing doped ceria **membranes** between electrolyte layers and **cathodes**)

IT 1314-23-4, Zirconium oxide (ZrO2), uses 1314-36-9, Yttrium oxide (Y2O3), uses 64417-98-7, Yttrium zirconium oxide 115135-47-2, Cobalt iron lanthanum strontium oxide (Co0.8Fe0.2La0.6Sr0.4O3 116875-84-4, Cerium samarium oxide (Ce0.8Sm0.2O1.9)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(structure and manufacture of solid **electrolyte fuel cells** containing doped ceria **membranes** between electrolyte layers and **cathodes**)

L40 ANSWER 5 OF 24 HCA COPYRIGHT 2004 ACS on STN

135:295298 Oxygen separation through hydroxide-conductive **membrane**. Li, Lin-Feng; Yao, Wenbin; Chen, Muguo (USA). U.S. Pat. Appl. Publ. US 20010030127 A1 20011018, 15 pp., Cont.-in-part of U.S. Ser. No. 373,469. (English). CODEN: USXXCO. APPLICATION: US 2001-836119 20010417. PRIORITY: US 1999-373469 19990812.

AB An **electrochem. cell** for separating a first gas from a mixture of gas is provided, particularly for separating oxygen from air. The cell includes a first **electrode**, a second **electrode** and a hydroxide-conducting **membrane** between the first

electrode and the second **electrode**.
IC ICM C25B009-00
ICS C25B013-00
NCL 204252000
CC **72-3** (Electrochemistry)
Section cross-reference(s): 48
ST oxygen sepn air hydroxide conductive **membrane** cell
IT **Electrolytic cells**
(**membrane**; oxygen separation through hydroxide-conductive **membrane** in)
IT Separation
(of oxygen through hydroxide-conductive **membrane**)
IT Polymers, uses
Polysulfones, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(oxygen separation from air through hydroxide-conductive **membrane** in **electrochem. cell** with hydroxide-conductive **membrane** from)
IT **Crosslinking agents**
(oxygen separation from air through hydroxide-conductive **membrane** in **electrochem. cell** with hydroxide-conductive **membrane** from polymer containing)
IT Polyamides, uses
Polyolefins
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(oxygen separation from air through hydroxide-conductive **membrane** in **electrochem. cell** with hydroxide-conductive **membrane** from polymer on support from)
IT Anion exchange **membranes**
(oxygen separation from air through hydroxide-conductive **membrane** in **electrochem. cell** with hydroxide-conductive **membrane** from polymers)
IT Air
(oxygen separation through hydroxide-conductive **membrane** in **electrochem. cell** from)
IT 9004-32-4, Carboxymethylcellulose 9004-32-4, Carboxymethylcellulose 9005-25-8, Corn starch, uses 9080-79-9, Sodium polystyrene sulfonate
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(oxygen separation from air through hydroxide-conductive **membrane** in **electrochem. cell** with hydroxide-conductive **membrane** from)
IT 110-26-9, Methylene bisacrylamide 2956-58-3, Ethylene bisacrylamide
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(oxygen separation from air through hydroxide-conductive **membrane** in **electrochem. cell** with hydroxide-conductive **membrane** from polymer containing **crosslinking agent**)
IT 7727-54-0, Ammonium persulfate 14915-07-2, Peroxide 15092-81-6D, Peroxydisulfate ((SO3)2O22-), of alkali metals
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(oxygen separation from air through hydroxide-conductive **membrane** in **electrochem. cell** with hydroxide-conductive **membrane** from polymer containing polymerization initiator)

IT 9002-89-5, Polyvinyl alcohol 9004-34-6, Cellulose, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(oxygen separation from air through hydroxide-conductive **membrane** in **electrochem. cell** with hydroxide-conductive **membrane** from polymer on support from)

IT 14280-30-9, Hydroxide, processes
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); PROC (Process)
(oxygen separation through hydroxide-conductive **membrane**)

IT 7782-44-7P, Oxygen, processes
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PREP (Preparation); PROC (Process)
(separation through hydroxide-conductive **membrane**)

L40 ANSWER 6 OF 24 HCA COPYRIGHT 2004 ACS on STN
133:210686 Manufacture of secondary **batteries**. Maruo, Hiroyuki; Ito, Shinichi (Mitsubishi Chemical Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000251920 A2 **20000914**, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-55791 19990303.

AB The **batteries** are prepared by applying an electrolyte solution containing a **polymerizable gelling agent**, an ionic metal salt, a polymerization initiator, and a nonaq. solvent on a **cathode** or **anode**; laminating the **electrode** with a 2nd **electrode** of an opposite polarity with the electrolyte layer in between, and thermally **polymerizing** the **gelling agent**; where the electrolyte is kept at ≤15° in a storage tank. The **batteries** may also have a porous electrolyte retaining **membrane** between the **electrodes**, and the electrolyte may also be applied on the **membrane**. The **batteries** are preferably Li **batteries**.

IC ICM H01M010-04
ICS H01M004-58; H01M010-40

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium **battery** gelled polymer electrolyte manuf

IT Secondary **batteries**
(lithium; manufacture of secondary lithium **batteries** with in-situ polymerized gelled electrolytes)

IT 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide (CoLiO2)
RL: DEV (Device component use); USES (Uses)
(manufacture of secondary lithium **batteries** with in-situ polymerized gelled electrolytes)

IT 108-32-7, Propylene carbonate 3505-67-7, 1.6-Dioxaspiro[4,4]nonane-2,7-dione 7791-03-9, Lithium perchlorate 27274-31-3
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(manufacture of secondary lithium **batteries** with in-situ polymerized gelled electrolytes)

L40 ANSWER 7 OF 24 HCA COPYRIGHT 2004 ACS on STN
133:210664 Manufacture of secondary **batteries**. Maruo, Hiroyuki (Mitsubishi Chemical Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000243448 A2 **20000908**, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-39686 19990218.

AB The **batteries** are manufactured by application of a nonaq. electrolyte, containing **polymerizable gelling agent**, ionic metal salt, and polymerization initiator, on **anode**

materials, and/or **cathode** materials, lamination of the **electrodes** by sandwiching the electrolyte between the **electrodes**, and heat-polymerization of the **gelling agent**. Coating of the electrolyte is carried out by its feeding from a chamber, in which the electrolyte is placed in contact with mol. O-containing gas. In the **battery** manufacturing process, a porous **membrane**, may also be coated with the electrolyte before lamination. **Batteries** with excellent cycle characteristics and high rate characteristics are obtained.

IC ICM H01M010-40
ICS H01M010-04

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary **battery** manuf electrolyte application; atm control electrolyte application **battery electrode**

IT **Battery** electrolytes
Controlled atmospheres
Secondary **batteries**
(manufacture of secondary **batteries** by storing of electrolytes in O-containing atmospheric before application on **electrodes**)

IT 108-32-7, Propylene carbonate 686-31-7, tert-Amyl peroxy-2-ethylhexanoate 3505-67-7, 1,6-Dioxaspiro[4.4]nonane-2,7-dione 7791-03-9, Lithium perchlorate 60182-11-8, Polyoxyethylene acrylate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(electrolyte containing; manufacture of secondary **batteries** by storing of electrolytes in O-containing atmospheric before application on **electrodes**)

IT 7782-44-7, Oxygen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of secondary **batteries** by storing of electrolytes in O-containing atmospheric before application on **electrodes**)

L40 ANSWER 8 OF 24 HCA COPYRIGHT 2004 ACS on STN

133:32697 In situ formed separator for a **battery**. Reichert, Samuel Firestone; Chang, Bernice Shou-hua; Keough, Kevin; Harvey, Andrew C.; Kovar, Robert Francis; Tiano, Thomas M. (Eveready Battery Company, Inc., USA). PCT Int. Appl. WO 2000036672 A1 **20000622**, 27 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US30275 19991217. PRIORITY: US 1998-216571 19981218.

AB A **battery** including a polar solvent transportive, ionically conductive separator formed directly on an **electrode** is prepared by applying a coating composition containing a polymer or gel dispersed in a polar solvent directly to the **electrode** surface and solidifying materials in the coating composition to form a separator **membrane**.

IC ICM H01M002-16
ICS H01M006-04; H01M010-24

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST **battery** separator in situ formed

IT Synthetic fibers

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(aluminum silicate; in situ formed separator for **battery**)

IT Synthetic fibers
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(boron carbide; in situ formed separator for **battery**)

IT Synthetic fibers
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(boron nitride; in situ formed separator for **battery**)

IT Synthetic fibers
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(boron; in situ formed separator for **battery**)

IT Fibers
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(cellulosic; in situ formed separator for **battery**)

IT Cellulose pulp
Coating materials
Cotton fibers
Primary **battery** separators
Viscose
(in situ formed separator for **battery**)

IT Acrylic polymers, uses
Epoxy resins, uses
Polyolefin fibers
Polyurethanes, uses
Rayon, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(in situ formed separator for **battery**)

IT Synthetic fibers
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(silica, fused; in situ formed separator for **battery**)

IT 77-77-0, Divinylsulfone
RL: TEM (Technical or engineered material use); USES (Uses)
(**crosslinking agent**; in situ formed separator for **battery**)

IT 9003-20-7, Polyvinyl acetate 9004-62-0, Hydroxyethyl cellulose
9004-64-2, Hydroxypropyl cellulose 9062-07-1, ι-Carrageenan
9064-57-7, Lambda-carrageenan 11114-20-8, κ-Carrageenan
37353-59-6, Hydroxymethyl cellulose
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(in situ formed separator for **battery**)

IT 10471-40-6
RL: TEM (Technical or engineered material use); USES (Uses)
(in situ formed separator for **battery**)

L40 ANSWER 9 OF 24 HCA COPYRIGHT 2004 ACS on STN
131:274252 Secondary lithium **batteries** and manufacture of their **electrodes**. Kami, Kenichiro; Kamishima, Keishi; Yamada, Manabu; Hosokawa, Norikazu; Shinkai, Ryuichiro (Denso Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11288741 A2 **19991019** Heisei, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-27966 19990204.

PRIORITY: JP 1998-24703 19980205.

AB The **batteries** have a Li conductive electrolyte between Li intercalating **electrodes**, where the **anode** and/or **cathode** has a porous **membrane** formed on the side facing the other **electrode**. The binder for the **electrodes** having the porous **membrane** is a OH group containing water soluble polymer and a **crosslinking agent** for the polymer. The **membrane** covered **electrodes** are prepared by applying the **electrode** active mass on a collector, applying a polymer solution on the **electrode**, contacting the **electrode** with a liquid that segregates the polymer from the solution, and drying to form the **membrane**.

IC ICM H01M010-40
ICS C08J009-28; H01M002-16; H01M004-02; H01M004-04; H01M004-62

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery electrode** porous polymer coating manuf

IT **Battery anodes**
(manufacture of carbonaceous **anodes** with porous polymer layer covered **cathode**-side surface for secondary lithium **batteries**)

IT Carbonaceous materials (technological products)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(manufacture of carbonaceous **anodes** with porous polymer layer covered **cathode**-side surface for secondary lithium **batteries**)

IT Polyimides, uses
RL: MOA (Modifier or additive use); USES (Uses)
(manufacture of carbonaceous **anodes** with porous polymer layer covered **cathode**-side surface for secondary lithium **batteries**)

IT **Battery electrodes**
(manufacture of **electrodes** with porous polymer layer covered **cathode**-side surface for secondary lithium **batteries**)

IT Polyimides, uses
Polyimides, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyether-; manufacture of carbonaceous **anodes** with porous polymer layer covered **cathode**-side surface for secondary lithium **batteries**)

IT Polyethers, uses
Polyethers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyimide-; manufacture of carbonaceous **anodes** with porous polymer layer covered **cathode**-side surface for secondary lithium **batteries**)

IT 24938-67-8, Ppo 534
RL: MOA (Modifier or additive use); USES (Uses)
(manufacture of carbonaceous **anodes** with porous polymer layer covered **cathode**-side surface for secondary lithium **batteries**)

L40 ANSWER 10 OF 24 HCA COPYRIGHT 2004 ACS on STN
131:259970 Solid polymer electrolyte **batteries** and their manufacture. Maeda, Shiori; Yamazaki, Mikiya; Fujii, Takanori; Nakane, Ikuro; Oikawa, Kuni (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11283673 A2 **19991015** Heisei, 10 pp. (Japanese). CODEN:

JKXXAF. APPLICATION: JP 1998-85813 19980331.

AB The **batteries** have a polymer gel electrolyte **membrane**, containing an electrolyte solution, between a **cathode** and a carbonaceous **anode**; where the electrolyte solution contains an organic solvent and a Li salt, except LiBF4, that does not hydrolyze at ≤100°. The **batteries** are prepd by inserting the carbonaceous **anode** and a **cathode** in a **battery** case, with a spacer between the **electrodes**, injecting a pre-gel electrolyte solution containing a **polymerizable compound** in the case, and heating the case to **polymerize** the **compound** to form the gel electrolyte.

IC ICM H01M010-40
ICS H01M002-02; H01M002-16

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** polymer electrolyte hydrolysis resistant lithium salt

IT **Battery** electrolytes
(polymer gel electrolytes containing hydrolysis resistant lithium salts for
secondary lithium **batteries**)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 26570-48-9, Poly(ethylene glycol) diacrylate
RL: DEV (Device component use); USES (Uses)
(polymer gel electrolytes containing hydrolysis resistant lithium salts for
secondary lithium **batteries**)

IT 90076-65-6 132404-42-3 132843-44-8 153347-65-0 156762-86-6 176719-70-3 185433-68-5 199450-09-4 244771-81-1
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(polymer gel electrolytes containing hydrolysis resistant lithium salts for
secondary lithium **batteries**)

L40 ANSWER 11 OF 24 HCA COPYRIGHT 2004 ACS on STN

131:259969 Solid polymer electrolyte **batteries** and their manufacture. Maeda, Shiori; Yamazaki, Mikiya; Fujii, Takanori; Nakane, Ikuro; Oikawa, Kuni (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11283672 A2 **19991015** Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-85812 19980331.

AB The **batteries** have a **cathode** containing an active mass on a **cathode** collector, an **anode** containing a Li intercalating carbonaceous on an **anode** collector, and a gel polymer electrolyte **membrane** between the **electrodes** in a **battery** case; where the **electrodes** and the electrolyte **membrane** are joined into 1 piece, and the **cathode** and/or **anode** collectors are metal foils having 10-95% perforation or foamed metal having 85-98% porosity. The **batteries** are prepared by **cathode** active mass and **anode** active mass on resp. collectors, inserting the **electrodes** in a **battery** case with a spacer between the **electrodes**, injecting a pre-gel electrolyte solution containing a **polymerizable compound** into the case, and heating the case to **polymerize** the **compound** to form the gel electrolyte.

IC ICM H01M010-40
ICS H01M002-16; H01M004-64; H01M004-80

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST polymer electrolyte **battery** structure manuf

IT **Battery electrodes**
(**electrodes** with perforated or porous metal collectors for secondary lithium **batteries** containing polymer gel electrolytes)
IT 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide (CoLiO2)
RL: DEV (Device component use); USES (Uses)
(**electrodes** with perforated or porous metal collectors for secondary lithium **batteries** containing polymer gel electrolytes)
IT 7440-50-8, Copper, uses
RL: DEV (Device component use); USES (Uses)
(perforated or porous metal **anode** collectors for secondary lithium **batteries** containing polymer gel electrolytes)
IT 7429-90-5, Aluminum, uses
RL: DEV (Device component use); USES (Uses)
(perforated or porous metal **cathode** collectors for secondary lithium **batteries** containing polymer gel electrolytes)
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 21324-40-3, Lithium hexafluorophosphate 26570-48-9, Poly(ethylene glycol diacrylate)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(structure and manufacture of secondary lithium **batteries** with polymer gel electrolytes)

L40 ANSWER 12 OF 24 HCA COPYRIGHT 2004 ACS on STN
131:150677 Method for preparing electroplating baths. Tanaka, Hitoshi (Furukawa Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11209899 A2 **19990803** Heisei, 5 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1998-14721 19980128.
AB An agent for smoothing the deposition of **electrodeposits** is added to the cathodic chamber of an electroplating bath-preparing tank equipped with a (cationic exchange) **membrane** for separating the tank into an anodic chamber containing an electroplating bath and an **anode** and a cathodic chamber containing an electrolytic solution and a **cathode** . Stable electroplating baths can be provided and the electroplating cost is reduced.
IC ICM C25D021-14
CC **72-8** (Electrochemistry)
Section cross-reference(s): 56
ST electroplating bath prepg method; **electrodeposition** smoothing agent cathodic chamber **membrane electrolytic cell**
IT Gelatins, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(deposition smoothing **agent**; tank containing **gelatin** for preparing baths for **electrodeposition** of tin)
IT **Electrodeposition**
(method for preparing electroplating baths)
IT 42616-80-8, Selemion CMV
RL: DEV (Device component use); USES (Uses)
(cation exchange **membrane**; tank equipped with cation exchange **membrane** for preparing baths for electroplating tin)
IT 235422-84-1, UTB 513Y
RL: TEM (Technical or engineered material use); USES (Uses)
(deposition smoothing agent containing surfactant; tank containing UTB-513Y for preparing baths for **electrodeposition** of tin)

L40 ANSWER 13 OF 24 HCA COPYRIGHT 2004 ACS on STN
125:315718 Electrochemical sensor. Pinkowski, Alexander (Prominent

Dosiertechnik Gmbh, Germany). Eur. Pat. Appl. EP 740149 A1 **19961030**, 6 pp. DESIGNATED STATES: R: CH, DE, ES, FR, GB, IT, LI. (German). CODEN: EPXXDW. APPLICATION: EP 1996-104939 19960328. PRIORITY: DE 1995-19515392 19950426.

AB An **electrochem**. measuring **cell** is presented, with an electrolyte chamber which is at least partially bounded by a **membrane** (e.g. Cyclopore) and is filled with an electrolyte; an **electrode** assembly is also provided for immersion in the electrolyte. In such a measuring cell, the possibilities for measurement are extended, especially the electrochem. determination of gaseous substances, as well as of charged or neutral species, dissolved in water. The **membrane** is hydrophilic and the electrolyte is highly viscous. The viscosity of the electrolyte is adjusted as a function of the pore size and thickness of the **membrane**, so that its leakage rate remains below a predetd. value, i.e. the leakage rate should be no greater than half the volume of the electrolyte chamber over a time period of ≤6 mo. The electrolyte contains a **gelling agent** selected from the hydroxyethyl cellulose group.

IC ICM G01N027-403

CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): **72**

ST electrochem sensor viscous **electrolyte cell**; hydrophilic **membrane** hydroxyethyl **cellulose** **electrochem** sensor; Cyclopore **membrane** electrochem sensor

IT **Membranes**
(sensor with hydrophilic Cyclopore)

IT Sensors
(electrochem., with highly viscous electrolyte gelled with hydroxyethyl cellulose and hydrophilic Cyclopore **membrane**)

IT 9004-62-0, Hydroxyethyl **cellulose**
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**electrochem**. sensor with highly viscous electrolyte gelled with)

IT 139044-91-0, Cyclopore
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(electrochem. sensor with highly viscous electrolyte gelled with hydroxyethyl cellulose and hydrophilic **membrane** of)

L40 ANSWER 14 OF 24 HCA COPYRIGHT 2004 ACS on STN

125:200855 Selective oxygen permeation **membranes** and **batteries** using them. Hara, Koji; Okabe, Kazuhiro; Mano, Hiroshi (Sumitomo Electric Industries, Japan). Jpn. Kokai Tokkyo Koho JP 08173775 A2 **19960709** Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-169877 19950705. PRIORITY: JP 1994-258298 19941024.

AB The **membranes** are manufactured from a solution of an O transforming supports, containing a metal complex capable of selectively reversibly combine with O, dispersed in a hydrophobic medium having a low CO2 dissolving rate by **membrane** formation. The dispersing medium may be gelled by a **gelling agent**. The **membranes** may also be prepared from a **gel** of an **agent** capable of selectively dissolving O. The **batteries**, e.g. air **batteries** and **fuel cells**, have the **membrane** between their **cathode** and air inlet holes.

IC ICM B01D069-00
ICS C01B013-02; H01M012-06

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** air oxygen permeable **membrane**; **fuel cell cathode** oxygen permeable **membrane**
IT **Cathodes**
(**battery**, selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)
IT Polyethers, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(fluorine-containing, in manufacture of selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)
IT **Cathodes**
(**fuel-cell**, selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)
IT Fluoropolymers
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(polyether-, in manufacture of selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)
IT 157884-95-2, Aqua calk 181315-02-6, Oleosorb SL 130
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in manufacture of selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)
IT 7782-44-7, Oxygen, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)
IT 812-47-5, Perfluorobutylamine 1122-58-3, 4-Dimethylaminopyridine 18433-52-8
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)
IT 67-68-5, DMSO, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(solvent; in manufacture of selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)
IT 9002-84-0, PTFE
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(substrate; in manufacture of selective oxygen permeation **membranes** for air **batteries** and **fuel cells**)

L40 ANSWER 15 OF 24 HCA COPYRIGHT 2004 ACS on STN
120:168836 Polymer-electrolyte **batteries**. Sasaki, Takashi; Makuchi, Keizo; Takeda, Kazunari; Ido, Shuichi (Japan Atomic Energy Res Inst, Japan; Yuasa Battery Co Ltd). Jpn. Kokai Tokkyo Koho JP 05290885 A2 **19931105** Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1992-94254 19920414.
AB The **batteries** use **cathodes** and **anodes**, composed of an ion-conductive polymer having a polyether structure and containing ≥1 dissolved ionic compound mixed with an electron-conductive material, and an ion-conductive polymer electrolyte containing ≥1 dissolved ionic compound; where the **anode** alone or the **anode**, the **cathode**, and the electrolyte are all prepared by an ionizing beam irradiation The ion-conductive polymer is preferably a polyether having reactive double bonds and containing ≥1 dissolved

ionic **compound**, and is **crosslinked** by the irradiation **Batteries** having LiCoO2 **cathodes** containing acetylene black, LiBF4, MeOC2H4OMe, γ-butyrolactone, and crosslinked PEG diacrylate-PEG acrylate copolymer; Li **anodes** containing powdered C, LiBF4, MeOC2H4OMe, γ-butyrolactone, and crosslinked PEG diacrylate-PEG acrylate copolymer; and electrolyte **membrane** containing LiBF4, MeOC2H4OMe, γ-butyrolactone, and crosslinked PEG diacrylate-PEG acrylate copolymer were prepared

IC ICM H01M010-40
ICS H01M004-60

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST polymer electrolyte lithium **battery**

IT Electron beam
(crosslinking with, in manufacture of **electrodes** and electrolytes containing polyethers for **batteries**)

IT **Battery** electrolytes
(lithium fluoroborate-crosslinked polyether-organic solvent)

IT **Cathodes**
(**battery**, lithium cobalt oxide, containing polymer electrolytes and acetylene black)

IT **Anodes**
(**battery**, lithium-intercalating carbon, containing polymer electrolytes and acetylene black)

IT 153502-06-8
RL: USES (Uses)
(crosslinked, electrolytes containing lithium fluoroborate and solvents and, for lithium **batteries**)

IT 96-48-0, γ-Butyrolactone 110-71-4, 1,2-Dimethoxyethane
RL: USES (Uses)
(electrolytes containing crosslinked polyethers and lithium fluoroborate and, for lithium **batteries**)

IT 14283-07-9, Lithium fluoroborate
RL: USES (Uses)
(electrolytes containing crosslinked polyethers and solvents and, for lithium **batteries**)

L40 ANSWER 16 OF 24 HCA COPYRIGHT 2004 ACS on STN
119:16972 Composite layered **electrode** based on polyacetylene. Tkachenko, L. I.; Zueva, A. F.; Saratovskikh, S. L.; Roshchupkina, O. S.; Efimov, O. N. (Inst. Khim. Fiz., Chernogolovka, Russia). Elektrokhimiya, 28(12), 1818-25 (Russian) **1992**. CODEN: ELKKAX. ISSN: 0424-8570.

AB A good cyclable composite layered **electrode** was obtained by the **chemical polymerization** of acetylene on an Al foil (grade An-4) by using modified polymerization catalysts containing, as a reducing agent, polyisobutylalumoxane with a mol. weight of 900. During cycling of the obtained composite layered **electrode** in the potential range of 0-2 V (vs. a Li reference **electrode**) in solns. of LiClO4 and LiBF4 in propylene carbonate, the polyacetylene film fulfills the role of an ion-conducting **membrane** (solid electrolyte) for Li+ ions with the formation of the β-phase LixAl alloy on an Al support, which allows one to significantly increase the **electrode** capacity. Some 25 charge-discharge cycles were conducted without significant loss of Coulombic efficiency and exfoliation of the polyacetylene film from the substrate.

CC **72-2** (Electrochemistry)

Section cross-reference(s): 35, 36, **52**, 73

ST composite layered **electrode** polyacetylene; aluminum base polyacetylene **membrane electrode**; solid electrolyte polyacetylene film; **battery electrode** polyacetylene modified

IT **Electrodes**
(composite layered, based on polyacetylene)

IT **Electrodes**
(**battery**, composite layered **electrode** based on polyacetylene in relation to)

IT Redox reaction
(electrochem., of lithium on polyacetylene-modified aluminum film **electrode**)

IT 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate
RL: PRP (Properties)
(composite layered **electrode** cycling at range of potentials in propylene carbonate solns. of)

IT 108-32-7, Propylene carbonate
RL: PRP (Properties)
(composite layered **electrode** cycling in range of potentials in lithium salt-containing)

IT 25067-58-7, Polyacetylene
RL: PRP (Properties)
(**electrodes** with composite layers based on)

IT 12798-95-7P
RL: PREP (Preparation)
(formation of β-phase, on aluminum substrate, for composite layered **electrode** based on polyacetylene)

IT 7439-93-2, Lithium, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(redox reaction of, on polyacetylene-modified aluminum film **electrode**)

IT 28206-64-6
RL: PRP (Properties)
(reducing **agent**, in modified **polymerization** catalysts for acetylene polymerization on aluminum foil)

L40 ANSWER 17 OF 24 HCA COPYRIGHT 2004 ACS on STN

112:39806 Manufacture of gas-diffusion **cathodes** for **batteries**. Kawaguchi, Masao; Watabe, Michio (Toshiba Battery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 01251564 A2 **19891006** Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1988-75905 19880331.

AB In the manufacture of gas-diffusion **cathodes** containing catalyst layer, separator layer, and poly(vinyl alc.) interlayer, the catalyst layer is coated with poly(vinyl alc.), dried, treated with **crosslinking agent**, and bonded with the separator. **Batteries**, especially air-Zn **batteries** using this **cathode**, have improved performance. Thus, a sheet containing 70% activated carbon and 30% PTFE was pressed with Ni mesh, and 1 side was bonded with a porous PTFE **membrane**. The other side was coated with 5% poly(vinyl alc.) (20 μL/cm2), dried, treated with 1.5% boric acid solution, and bonded with polypropylene porous **membrane** and with vinylon **membrane** previously coated with poly(vinyl alc.), by pressure. Air-Zn **batteries** using this **cathode**, Zn **anode** and KOH electrolyte had longer discharge duration and higher storage stability than reference **battery**, for which water was used as the **crosslinking agent** instead of the 5% boric acid.

1C ICM H01M012-06
1CA H01M004-88
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **cathode** air polyvinyl alc crosslinking; **battery** air zinc **cathode** manuf; boric acid crosslinking polyvinyl alc **cathode**
IT **Cathodes**
(**battery**, air-diffusion, containing poly(vinyl alc.) interlayer, manufacture of, **crosslinking agent** in, for **battery** performance)
IT 9002-89-5P, Poly(vinyl alcohol)
RL: PREP (Preparation)
(**cathode** containing interlayer of, air-diffusion, manufacture of, **crosslinking agent** in, for **battery** performance)
1T 573-58-0, Congo Red 1333-73-9 10043-35-3, Boric acid (H3BO3), uses and miscellaneous
RL: MOA (Modifier or additive use); USES (Uses)
(**crosslinking agent**, polyvinyl alc. interlayer treated with, manufacture of air-diffusion **cathodes** containing, for **battery** performance)

L40 ANSWER 18 OF 24 HCA COPYRIGHT 2004 ACS on STN
108:97885 Manufacture of gas-diffusion **cathodes** for air **batteries**. Yamanobe, Teruji; Watabe, Michio; Sato, Hitomi; Kawaguchi, Masao (Toshiba Battery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 62222579 A2 **19870930** Showa, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1986-64745 19860325.
AB In the manufacture of gas-diffusion **cathodes** for air-Zn **batteries**, the **cathode** catalyst layer and the separator are bonded by applying poly(vinyl alc.) to the **crosslinking agent**-coated surface of the catalyst layer. Thus, a 7:3 (weight) activated C-PTFE powder catalyst sheet bonded with a porous PTFE **membrane** on 1 side was sprayed on the other side with 1.5 μL/cm2 1.5% H3BO3 solution, dried, coated with 5% Gohsenol GH-17 at 20 μL/cm2, and a nonwoven polypropylene separator was pressed to the coated side of the catalyst sheet to obtain a **cathode**. Zn-air **batteries** using these **cathodes** and 25% KOH electrolyte had longer discharge times than **batteries** without H3BO3 when discharged at 45°, discharged intermittently, or discharged after 30-day storage at 45° and 90% relative humidity.
IC ICM H01M012-06
ICS H01M004-88
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **cathode** gas diffusion polyvinyl alc; **battery** **cathode** polyvinyl alc crosslinking
IT **Cathodes**
(**battery**, gas-diffusion, air, crosslinked poly(vinyl alc.) adhesives for binding separators with)
1T Dyes
(direct, congo red-type, **crosslinking agent**, for poly(vinyl alc.) adhesive, in binding gas-diffusion **cathodes** in zinc-air **batteries**)
IT 55199-96-7, Poly(vinyl alcohol) borate
RL: USES (Uses)

(adhesive, for binding gas-diffusion **cathodes** with separators, in zinc-air **batteries**)

IT 1333-73-9 10043-35-3, Boric acid, uses and miscellaneous
RL: MOA (Modifier or additive use); USES (Uses)
(**crosslinking agent**, for poly(vinyl alc.) adhesive, in binding gas-diffusion **cathodes** in zinc-air **batteries**)

L40 ANSWER 19 OF 24 HCA COPYRIGHT 2004 ACS on STN
105:194600 **Fuel cells** with cation-exchange resin electrolytes. Mukoyama, Yoshiyuki; Hirai, Osamu; Kobayashi, Yuji (Hitachi Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 61078067 A2 **19860421** Showa, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1984-200248 19840925.

AB **Fuel cells** use **electrolytes** that are prepared from particles of strongly acidic cation-exchange resins containing 0.8-5.0 mol% **crosslinking agents** and which ionize in H2O. The use of the electrolyte eliminates unwanted transfer and leakage, which result in dilution of the fuel and decrease in the cell efficiency. Thus, styrene 179, a mixture of divinylbenzene-40% monoethylvinylbenzene 13, PhMe 115, Bz2O2 10 g, 10% aqueous suspension of insol. Ca3(PO4)2 300 mL, and H2O 1.4 L were homogenized with increase in temperature and held at 70° for 1 h. Further polymerization at 80-85° for 4 h gave porous particles (containing ≥50% 10-20-μ particles), which were washed with dilute HCl and dried. Sulfonation in 300 g C2H4Cl2 and 97% H2SO4 gave cation-exchange resin having exchange capacity of 4.3 mequiv/g and degree of crosslinking of 3.3 mol%. The resin particles were made into a paste with addition of H2O and SiC powder, and filled into the cavity between the fuel (MeOH) **anode** and an ion-exchange **membrane** covering the oxidant (air) **cathode**. The obtained **fuel cell** was operated without dilution of MeOH, and showed excellent performance. Supply of the **fuel** in this **cell** was also simplified.

IC ICM H01M008-10
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **fuel cell** cation exchange resin; divinylbenzene copolymer sulfonatede **fuel cell**; monoethylvinylbenzene copolymer sulfonatede **fuel cell**; styrene copolymer sulfonatede **fuel cell**; sulfonated polymer **electrolyte fuel cell**
IT Cation exchangers
(crosslinked polystyrene, sulfonated, for **fuel-cell electrolyte**)
IT **Fuel cells**
(with cation exchange-resin electrolytes)
IT 9003-70-7D, sulfonated 9052-95-3D, sulfonated
RL: USES (Uses)
(crosslinked, cation-exchange resin, for **fuel-cell electrolyte**)

L40 ANSWER 20 OF 24 HCA COPYRIGHT 2004 ACS on STN
102:122052 Silver oxide **battery**. (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 59173969 A2 **19841002** Showa, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1983-49236 19830323.

AB A **battery** that is stable during high temperature storage has a **cathode** from press molded Ag oxide, graphite, and MnO2 in a 90:5:5 weight ratio, a separator from laminated cellophane semipermeable **membrane** and ethylene-methacrylic acid graft polymer, and on the **anode** side a nonwoven nylon fabric also serving as a separator and a Zn amalgam **anode** gelled with Na polyacrylate.

IC H01M006-22; H01M006-12

CC **72-3** (Electrochemistry)

ST silver oxide zinc amalgam **battery**; gelled zinc amalgam **anode battery**; ethylene methacrylic acid polymer separator; nylon fiber separator **battery**

IT Polyamide fibers, uses and miscellaneous
RL: USES (Uses)
(separator, in zinc amalgam-silver oxide **battery**)

IT **Batteries**, primary
(zinc amalgam-silver oxide, for high temperature storage)

IT **Gelation**
(**agents**, sodium polyacrylate, for zinc amalgam for **battery anode**)

IT 12714-27-1
RL: PRP (Properties)
(**anode**, in **battery** with silver oxide for high temperature storage)

IT 11113-88-5
RL: PRP (Properties)
(**battery**, with zinc amalgam, for high temperature storage)

IT 25053-53-6
RL: PRP (Properties)
(graft, laminated with cellophane **membrane**, for separator for zinc amalgam-silver oxide **battery**)

IT 1313-13-9, uses and miscellaneous
RL: USES (Uses)
(silver oxide **cathode** containing graphite and, for zinc amalgam **battery** for high temperature storage)

IT 7782-42-5, uses and miscellaneous
RL: USES (Uses)
(silver oxide **cathode** containing manganese dioxide and, for zinc amalgam **battery** for high temperature storage)

IT 9003-04-7
RL: PRP (Properties)
(zinc amalgam gelled with, for silver oxide **battery** for high temperature storage)

L40 ANSWER 21 OF 24 HCA COPYRIGHT 2004 ACS on STN

101:119365 Air **battery**. (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 59094382 A2 **19840531** Showa, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1982-202034 19821119.

AB The air intake in an alkaline air **battery** is partitioned by an O-selectively permeable composite **membrane** formed by bonding a thin layer of a hydrated or hydrophilic metal oxide to a porous **membrane** having a pore size of ≤0.1 μ. Metal oxide may be selected from SnO2, ZnO, Al2O3, MgO, CaO, SrO, BaO, TiO2, and SiO2. The composite **membrane** is also formed by laminating the metal oxide layer on the surface of a **membrane** coated with a monolayer of plasma-**polymerized** fluorinated organic **compds**. The use of the composite **membranes** increases the capacity and storage life of the **battery** and prevents leakage of the electrolyte. Thus, porous polycarbonate **membrane** having 0.03 μ pores and 0.42%

pore area was coated on 1 side by sputtering in Ar/O mixture by using Sn, Zn, Al, Mg, Ca, Sr, Ba, Ti, or Si to form the composite **membrane**.

IC H01M012-06
CC **72-3** (Electrochemistry)
Section cross-reference(s): 38
ST **battery** air composite **membrane**; polycarbonate oxide **membrane** air **battery**; metal oxide polycarbonate **membrane battery**
IT Polycarbonates
RL: USES (Uses)
(**membranes**, oxide-coated, for air intake of zinc-air **batteries**)
IT **Batteries**, primary
(zinc-air, with composite **membrane** for air intake)
IT 7440-66-6, uses and miscellaneous
RL: USES (Uses)
(**anodes**, in zinc-air **batteries**)
IT 1304-28-5, uses and miscellaneous 1305-78-8, uses and miscellaneous
1309-48-4, uses and miscellaneous 1314-11-0, uses and miscellaneous
1314-13-2, uses and miscellaneous 1344-28-1, uses and miscellaneous
7631-86-9, uses and miscellaneous 13463-67-7, uses and miscellaneous
18282-10-5
RL: USES (Uses)
(polycarbonate **membranes** coated with, for air intake of zinc-air **batteries**)

L40 ANSWER 22 OF 24 HCA COPYRIGHT 2004 ACS on STN
96:43105 **Electrode** device and a dispersion useful in its preparation. Poulsen, Jorgen (Radiometer A/S, Den.). Eur. Pat. Appl. EP 39136 A2 **19811104**, 22 pp. DESIGNATED STATES: R: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1981-301299 19810326. PRIORITY: DK 1980-1332 19800327.
AB The title apparatus is for the determination of the concentration or the partial pressure of a gas in a liquid or in a gas mixture This apparatus consists of a measuring surface constituted by or comprising the sensitive part of a measuring **electrode** and a **membrane** which is placed in front of the measuring surface and limits a volume of an electrolytic solution which is in contact with the measuring **electrode**. The **membrane** is permeable to the gas to be determined and the **electrode** device comprises essentially non-compressible particles between the measuring surface and the **membrane** in a sufficient amount to keep the **membrane** at a distance from the measuring surface. The preparation of an electrolyte dispersion containing carborundum particles is described. Agarose or CM-cellulose was used as a **gelling agent**.
IC G01N027-28; G01N027-46
CC **72-2** (Electrochemistry)
Section cross-reference(s): 79
ST gas analysis carborundum particle gel; **electrolytic cell** gas partial pressure
IT Gas analysis
(**electrochem., cell** in dispersion for)
IT **Electrolytic cells**
(for gas anal.)

L40 ANSWER 23 OF 24 HCA COPYRIGHT 2004 ACS on STN
93:122676 Apparatus and methods for preparing ammonium peroxydisulfate solutions. Matache, Savel; Toc, Valer; Romul-Muntean, Florian; Florea, Constantin (Centrala Industriala de Fier si Fibre Chimica, Rom.). Rom. RO 65202 **19780904**, 4 pp. (Romanian). CODEN: RUXXA3. APPLICATION: RO 1974-77422 19740128.

AB Aqueous (NH4)2S2O8 solns. of improved quality, for use as initiators in the polymerization of vinyl derivs., are obtained from waste (NH4)2SO4 solns. by continuousanodic oxidation and purification electrodialysis at 5-30°, using an anodic c.d. of 0.2-1 A/cm2 and cathodic c.d. of 0.02-0.3 A/cm2. In the title apparatus, each cell is divided by 2 ion-permeable **membranes** intocompartments, having sep. bottom inlet and top outlet conduits connected to a common elec. insulated system, consisting of 2 liquid-gas separators, 2 recycle and 2 feeding units composed of pumps, heat-exchangers and storage tanks. Thus, 5000 kg/h of a waste solution from caprolactam production containing 400 g (NH4)2SO4/L and 405 kg/h demineralized water was processed in an apparatus containing Pb **cathodes** and Pt **anodes**, applying 520 A and a cell voltage of 220 V and a recycling rate of 6000 kg/h to give 470 kg/h of an aqueous solution containing 16% (NH4)2S2O8, as well as by-products in form of anodic and cathodic gases and a residual (NH4)2SO4 solution which via simple operations can be converted into a useful fertilizer.

IC C01C001-14

CC **72-8** (Electrochemistry)
Section cross-reference(s): 27, 35, 49

ST ammonium peroxydisulfate electrochem prodn; sulfate waste ammonium peroxydisulfate electroprodn; caprolactam manuf ammonium peroxydisulfate electroprodn; **cell electrolytic** ammonium peroxydisulfate prodn; polymn initiator ammonium peroxydesulfate electroprodn

IT Vinyl **compounds**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**polymerization** of, electrochem. manufacture of ammonium peroxydisulfate as initiator for)

IT **Electrolytic cells**
(diaphragm, for ammonium peroxydisulfate manufacture from ammonium sulfate waste solns.)

IT 7727-54-0P
RL: PREP (Preparation)
(manufacture of, from waste ammonium sulfate solns., **electrolytic cell** for)

L40 ANSWER 24 OF 24 HCA COPYRIGHT 2004 ACS on STN
63:55561 Original Reference No. 63:10175e-g Coating of metals with resins and pigments by electrophoresis. Borkon, George P. NL 6408073 **19650201**, 11 pp. (Unavailable). PRIORITY: DE 19630730.

AB An object to be coated is made the **anode** in a bath of H2O-soluble resins and pigments, while in the bath or on the surface of the subject, oxidizing compds. are present, especially Zn, Cd, or their compds. The decomposition products are adsorbed as components of the coating. The object treated is, if necessary, washed, dried, and (or) roasted. O-absorbing compds., such as Co and (or) Mn compds., may also be present, as well as **compds.** that are **polymerized** by O, such as H2O-soluble

resins or oils. Osmosis can be carried out by means of **membranes** or semipermeable filters. Migration of H from the **cathode** to the object to be coated can be prevented by placing separation walls in the bath. Thus, a bath for the electrophoresis of a Zn plate was prepared by grinding together 67 parts baryta and 100 parts of an alkyl phenol resin (e.g. Resydrol P-410), diluting with H2O, and then adding 9 parts iso-BuOH and 159 parts H2O. A Zn plate with a surface of 100 cm.2 was immersed into the bath and connected to the pos. pole of a **battery**. Two Fe plates, each with a surface of 100 cm.2, were placed on each side of, and 10 cm. from, the Zn plate and connected to the neg. pole of an 18-v. **battery**. The current was interrupted after 3 min. by removal of the Zn plate from the bath and the plate was annealed for 20 min. at 170°. The c.d. of the Zn plate was originally 4.60 ma./cm.2, and 0.71 ma./cm.2 at the end. The thickness of the coating was 45 μ. A smooth, ivory-colored coating without discoloration and perforation was obtained with excellent adherence to the plate and with high impact strength.

IC B01K
CC **52** (Coatings, Inks, and Related Products)

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L68 ANSWER 1 OF 6 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2004-303743 [28] WPIX
CR 2004-008510 [01]
DNN N2004-241836 DNC C2004-115480
TI Composite electrolyte for use in **electrochemical fuel cells** comprises inorganic cation exchange material, silica-based material and proton-conducting polymer-based material.
DC A18 A28 A85 E11 L03 X16
IN KURANO, M R; MADA KANNAN, A N; TAFT, K M
PA (KURA-I) KURANO M R; (KANN-I) MADA KANNAN A N; (TAFT-I) TAFT K M
CYC 1
PI US 2004048129 A1 20040311 (200428)* 20 H01M008-10
ADT US 2004048129 A1 CIP of US 2002-219083 20020813, US 2003-644227 20030819
FDT US 2004048129 A1 CIP of US 6630265
PRAI **US 2003-644227 20030819; US 2002-219083 20020813**
IC ICM H01M008-10
AB US2004048129 A UPAB: 20040429
NOVELTY - A composite electrolyte for use in **electrochemical fuel cells** comprises an inorganic cation exchange material; a silica-based material; and a proton-conducting polymer-based material. The inorganic cation exchange material comprises 0.1-99 weight%

composite electrolyte.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(1) an **electrochemical fuel cell** comprising an **anode**; a **cathode**; a fuel supply to the **anode**; an oxidant supply to the **cathode**; and a composite electrolyte positioned between the **anode** and **cathode**;

(2) a method of fabricating a composite electrolyte for use in an **electrochemical fuel cell** by applying onto a surface of a substrate a viscous liquid composition of an inorganic cation exchange material, silica-based material, polymer-based material, and a solvent-dispersant; spreading the viscous liquid composition to form a uniform thickness layer on the substrate; and allowing the solvent to evaporate from the viscous liquid composition to yield the composite electrolyte; and

(3) a method for producing a composite **membrane** by grinding a sulfonated polyether ether ketone (SPEEK) and clay mixture and dissolving the mixture in a distilled dimethylformamide (DMF) to form a solution; heating the solution until it thickens and attains a casting consistency; degassing the solution in a vacuum oven; casting the solution into a film on a glass surface using a doctor blade; curing the film; and peeling the film from the glass.

USE - For use in **electrochemical fuel cells** (claimed).

ADVANTAGE - The composite electrolyte exhibits higher ion exchange capacity, proton conductivity and/or lower gas crossover. It exhibits excellent physicochemical properties and superior **fuel cell** performance in hydrogen oxygen **fuel cells**

.

DESCRIPTION OF DRAWING(S) - The figure shows operation of proton exchange **membrane** (PEM) **fuel cell**.

Dwg.1/11

FS CPI EPI
FA AB; GI; DCN
MC CPI: A08-S02; A10-E; A11-A; A11-A04; A11-B04C; A11-C; A11-C02; A12-E06; A12-S06A; E05-E03; E11-D; E11-E; E31-A02; E31-A03; E31-A05; E31-D01; E31-D02; E31-P02B; E31-P02D; E31-P03; E31-P04; E31-P05; E34-C02; E35-K02; L03-E04A2
EPI: X16-C01C

L68 ANSWER 2 OF 6 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-845120 [78] WPIX
DNN N2003-675499 DNC C2003-237409
TI A reference half-cell useful for a potentiometric measurement cell and useful generally in chemistry. medicine, and in environmental studies.
DC A12 A89 J04 S03
IN FRANZHELD, R; PECHSTEIN, T; SCHOLZ, K
PA (ENDR) ENDRESS & HAUSER CONDUCTA GES MESS; (ENDR) ENDRESS & HAUSER CONDUCTA GMBH & CO KG
CYC 102
PI WO 2003076917 A2 20030918 (200378)* GE 14 G01N027-30
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SI SK SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
DE 10243930 A1 20030925 (200378) G01N027-30

AU 2003206960 A1 20030922 (200431) G01N027-30
ADT WO 2003076917 A2 WO 2003-EP1958 20030226; DE 10243930 A1 DE 2002-10243930 20020920; AU 2003206960 A1 AU 2003-206960 20030226
FDT AU 2003206960 A1 Based on WO 2003076917
PRAI **DE 2002-10210060 20020308**
IC ICM G01N027-30
ICS G01N027-401
AB WO2003076917 A UPAB: 20031203
NOVELTY - A reference half-cell for use in a potentiometric measurement cell (2) for determination of ionic activity in a measurement solution (7), where the reference half cell consists of an **electrode** element (9) and a bridge **electrolyte** (8), where **cell** has an **electrode** body (5) electrical contact with solution (7), and the bridge electrolyte is a gel containing the electrolyte, i.e. a cationic gel based on diallyldimethylammonium chloride (DADMAC).

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for:

(1) the bridge electrolyte for use in the cell, which is connected to a potentiometric measurement element, which measures the ion concentration in solution (7);

(2) a process for synthesis of a bridge electrolyte comprising a cationic gel based on DADMAC, where in a first step linear DADMAC-copolymer of predetermined concentration of reactive functions is synthesized, and in a second step the reactive linear copolymer is **crosslinked** with multifunctional **agents**.

USE - The reference half-cell is useful generally in chemistry, medicine and in environmental studies.

ADVANTAGE - The **electrodes** require no maintenance. The components of the measurement solution which diffuse into the reference half-cell cannot be transported to the reference element, so that the reference element is protected against poisoning.

DESCRIPTION OF DRAWING(S) - Figure 1 shows a diagram of a pH sensor inserted in the half-cell.

pH sensor, 1

measurement half-cell, 2

spherical **membrane** of the measurement half-cell, 3

diaphragm 6

measurement solution, 7

conductors 9, 10

Dwg.1/2

FS CPI EPI
FA AB; GI
MC CPI: A12-E14; A12-L04B; J04-C02
EPI: S03-E03B1; S03-E03C

L68 ANSWER 3 OF 6 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-522985 [49] WPIX
CR 2003-513462 [48]
DNN N2003-415034 DNC C2003-140582
TI Solid polymer electrolyte **membrane** for **fuel** **cell** comprises fluorinated ionomer having imbibed in it the polymerization product of composition comprising non-fluorinated, non-ionomeric monomer.
DC A14 A25 A85 L03 X16
IN YANG, Z Y
PA (DUPO) DU PONT DE NEMOURS & CO E I
CYC 101
PI WO 2003033576 A1 20030424 (200349)* EN 36 C08J005-24
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU

MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

ADT WO 2003033576 A1 WO 2002-US32838 20021015
PRAI **US 2001-329361P 20011015**
IC ICM C08J005-24
ICS C08J007-16; H01M004-88; H01M004-94; H01M008-10
AB WO2003033576 A UPAB: 20030731
NOVELTY - Solid polymer electrolyte **membrane** comprises a fluorinated ionomer having imbibed in it the polymerization product of a composition comprising a non-fluorinated, non-ionomeric monomer. The fluorinated ionomer comprises at least 6 mole% of monomer units having a fluorinated pendant group with a terminal ionic group.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:
(a) a catalyst coated **membrane** comprising a solid polymer electrolyte **membrane** having first and second surfaces, an **anode** on the first surface, and a **cathode** on the second surface; and
(b) a **fuel cell** comprising a solid polymer electrolyte **membrane**.
USE - The solid polymer electrolyte **membrane** is used in a catalyst coated **membrane** (claimed) or in a **fuel cell** (claimed), e.g. direct methanol **fuel cells** and hydrogen **fuel cells**.
ADVANTAGE - The use of the inventive solid polymer electrolyte **membrane** provides a **membrane** having reduced methanol permeability at modest cost in conductivity, and provides an improved **fuel cell**.
Dwg.0/1
FS CPI EPI
FA AB
MC CPI: A10-E21B; A12-E06B; A12-W11A; L03-E04A2
EPI: X16-C01C; X16-E06A; X16-F02

L68 ANSWER 4 OF 6 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-229879 [22] WPIX
DNN N2003-182810 DNC C2003-059295
TI **Membrane** comprising cross linked polymers, useful for the production of **fuel cells**, is prepared by casting a solution containing a basic polymer and a polysulfone.
DC A26 A85 J01 L03 X16
IN KIEFER, J; UENSAL, O
PA (CELA) CELANESE VENTURES GMBH
CYC 30
PI WO 2003016384 A2 20030227 (200322)* GE 28 C08J005-22
RW: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR
W: BR CA CN JP KR MX US
DE 10140147 A1 20030306 (200326) B01D071-00
ADT WO 2003016384 A2 WO 2002-EP8992 20020810; DE 10140147 A1 DE 2001-10140147 20010816
PRAI **DE 2001-10140147 20010816**
IC ICM B01D071-00; C08J005-22
ICS C08L081-06; H01M008-02
AB WO2003016384 A UPAB: 20030402

NOVELTY - A **membrane** comprising cross linked polymers is prepared by casting a solution containing a basic polymer with at least one **amine** group in the repeating unit, a cross linking reagent and a basic catalyst, removal of the solvent, performing the linking reaction in the film and doping of the film with a strong acid whereby the basic polymer is mixed with a polysulfone.

DETAILED DESCRIPTION - A **membrane** (I) comprising cross linked polymers is prepared by:

(A) production of a solution containing a basic polymer with at least one **amine** group in the repeating unit, at least one cross linking reagent and additionally at least one basic catalyst in a solvent;

(B) casting a film using the solution from step (A);

(C) removal of the solvent;

(D) performing the cross linking reaction in the film obtained from step (C); and

(E) doping of the film with a strong acid whereby the basic polymer in step (A) is mixed with a polysulfone.

INDEPENDENT CLAIMS are also included for:

(i) a **membrane electrode** (II) unit comprising at least one **electrode** and at least one **membrane** (I);

(ii) a **fuel cell** comprising at least one **membrane electrode** unit (II).

USE - The **membrane** (I) is useful for the production of **membrane electrode** units (II) and **fuel cells** (claimed).

ADVANTAGE - The **membrane** (I) has improved impact resistance.

Dwg.0/0

FS CPI EPI
FA AB; GI
MC CPI: A02-A00A; A05-J02; A05-J06; A07-A03; A08-D01; A10-E01; A10-G01A; A11-B04C; A11-C02; A12-E06B; J01-C03; L03-E04B
EPI: X16-E06A

L68 ANSWER 5 OF 6 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2002-328394 [36] WPIX
CR 2000-638095 [61]; 2002-370871 [40]
DNN N2002-257662 DNC C2002-094821
TI Polymer **matrix** material for supporting liquid solution, for use as separators in **electrochemical cells**, comprises polymerization product of monomer(s) from water-soluble, ethylenically-unsaturated acids and acid derivatives.
DC A85 L03 X16
IN CALLAHAN, R W; CHEN, M; STEVENS, M G; CALLAHAN, R; STEVENS, M
PA (CALL-I) CALLAHAN R W; (CHEN-I) CHEN M; (STEV-I) STEVENS M G; (REVE-N) REVEO INC
CYC 101
PI US 2002010261 A1 20020124 (200236)* 13 C08L031-00
WO 2003092094 A2 20031106 (200401) EN H01M000-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZM ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW
TW 554563 A 20030921 (200425) H01M006-04
ADT US 2002010261 A1 CIP of US 1999-259068 19990226, CIP of US 2000-482126

20000111, Provisional US 2001-301558P 20010628, US 2001-942887 20010830; WO 2003092094 A2 WO 2002-US20486 20020628; TW 554563 A TW 2002-114385 20020628

PRAI **US 2001-301558P 20010628**; US 1999-259068 19990226; US 2000-482126 20000111; **US 2001-942887 20010830**; **US 2001-943053 20010830**

IC ICM C08L031-00; H01M000-00; H01M006-04

AB US2002010261 A UPAB: 20040418

NOVELTY - A polymer **matrix** material (1, 2) comprises a polymerization product of monomer(s) from water-soluble, ethylenically-unsaturated acids and acid derivatives; and a **crosslinking agent**. Water is used to swell the polymer material to a defined volume upon curing.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for the production of the polymer **matrix** material comprising polymerization of an aqueous solution of monomer(s).

USE - For supporting a liquid solution, for use e.g. as a separator in rechargeable **electrochemical cells**, such as **batteries**, **fuel cells**, sensors, **electrochemical** gas separation systems, electrochromic devices and protein separation devices.

ADVANTAGE - The material provides improved ionic conductivity while providing an effective barrier against the penetration of metal dendrites and the diffusion of reaction products. It prevents penetration of dendrite metal through the **membrane**, and protects the negative **electrode** from dendrite formation, particularly during charging of rechargeable cells. It also prevents destruction of the cell by preventing diffusion of the metal oxidation product into the electrolyte solution.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic depiction of a zinc/air **fuel cell** incorporating an **anode** protective polymer **matrix membrane** and a hydroxide conducting polymer **matrix membrane**.

Polymer **matrix** material 1, 2

Dwg.1/7

FS CPI EPI

FA AB; GI

MC CPI: A04-H00H; A10-B04; A12-E06; L03-E01A; L03-E04G
EPI: X16-C16; X16-F02

L68 ANSWER 6 OF 6 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN

AN 2000-638095 [61] WPIX

CR 2002-328394 [36]; 2002-370871 [40]

DNN N2000-473313 DNC C2000-191852

TI New solid gel **membrane** useful in electrochemical devices e.g. metal/air, Zn/MnO2, Ni/Cd, smart windows and flat panel displays comprises an ionic species within the gel solution phase.

DC A18 A23 A26 A85 L03 P81 S03 U14 V07 X12 X16 X25

IN CHANG, Y; CHEN, M; LI, L; TOM, K; TSAI, T; YAO, W; KI, L

PA (REVE-N) REVEO INC; (CHEN-I) CHEN M; (LILL-I) LI L; (TSAI-I) TSAI T; (CHAN-I) CHANG Y; (TOMK-I) TOM K; (YAOW-I) YAO W

CYC 92

PI WO 2000051198 A2 20000831 (200061)* EN 44 H01M006-22
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

AU 2000035030 A 20000914 (200063)
EP 1155467 A2 20011121 (200176) EN H01M006-22
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
BR 2000008506 A 20020205 (200213) H01M006-22
US 6358651 B1 20020319 (200224) H01M002-16
CN 1341283 A 20020320 (200246) H01M006-22
TW 463405 A 20011111 (200248) H01M002-14
US 2002102465 A1 20020801 (200253) H01M010-40
KR 2002020873 A 20020316 (200263) H01M008-10
JP 2002538585 W 20021112 (200275) 46 H01M012-06
US 2003022047 A1 20030130 (200311) H01M012-06
US 2003099872 A1 20030529 (200337) H01M012-06
US 6605391 B2 20030812 (200355) H01M002-14
MX 2001008664 A1 20020201 (200362) B01D069-10

ADT WO 2000051198 A2 WO 2000-US4881 20000225; AU 2000035030 A AU 2000-35030 20000225; EP 1155467 A2 EP 2000-913617 20000225, WO 2000-US4881 20000225; BR 2000008506 A BR 2000-8506 20000225, WO 2000-US4881 20000225; US 6358651 B1 CIP of US 1999-259068 19990226, US 2000-482126 20000111; CN 1341283 A CN 2000-804335 20000225; TW 463405 A TW 2000-103224 20000224; US 2002102465 A1 CIP of US 1999-259068 19990226, Cont of US 2000-482126 20000111, US 2001-13016 20011130; KR 2002020873 A KR 2001-710896 20010825; JP 2002538585 W JP 2000-601703 20000225, WO 2000-US4881 20000225; US 2003022047 A1 Div ex US 1999-259068 19990226, US 2002-186439 20020701; US 2003099872 A1 US 1999-259068 19990226; US 6605391 B2 US 1999-259068 19990226; MX 2001008664 A1 WO 2000-US4881 20000225, MX 2001-8664 20010824

FDT AU 2000035030 A Based on WO 2000051198; EP 1155467 A2 Based on WO 2000051198; BR 2000008506 A Based on WO 2000051198; US 2002102465 A1 Cont of US 6358651; JP 2002538585 W Based on WO 2000051198; MX 2001008664 A1 Based on WO 2000051198

PRAI US 2000-482126 20000111; US 1999-259068 19990226; **US 2001-13016 20011130; US 2002-186439 20020701**

IC ICM B01D069-10; H01M002-14; H01M002-16; H01M006-22; H01M008-10; H01M010-40; H01M012-06
ICS C08F251-00; C08F257-02; C08F273-00; C08J005-22; C08L051-02; G02F001-15; G02F001-153; H01B001-06; H01B001-12; H01M002-18; H01M004-04; H01M004-42; H01M004-46; H01M008-02; H01M010-26; H01M016-00

ICI C08L033:00

AB WO 200051198 A UPAB: 20030928
NOVELTY - A polymer based solid gel **membrane** (1) contains an ionic species within the gel solution phase. (1) comprises the polymerization product of a polymerization initiator, a monomer selected from water soluble ethylenically unsaturated amides and acids, and a reinforcing element selected from water soluble and water swellable polymers. The ionic species is added prior to polymerization.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following: (A) a rechargeable **electrochemical cell** comprises a separator, an **anode**, a **cathode** and a charging **electrode**. The **cathode** and charging **electrode** may be single bifunctional or individual and separate **electrodes**. The separator comprises an ion-conducting (1) comprising a support positioned between the **anode** and charging **electrode**; and (B) a method of inhibiting corrosion of a metal **anode** in a metal/air **fuel cell** system comprises a metal **anode** and an air **cathode**. The method comprises disposing at least one (1) between the **anode** and

cathode. (1) is formed on a surface of metal **anode**.
USE - In power sources e.g. zinc/air, cadmium/air, lithium/air, magnesium/air, iron/air, aluminum/air (claimed). Zn/Ni, Zn/MnO2, Zn/AgO, Fe/Ni, lead-acid, Ni/Cd, alkaline hydrogen **fuel cells**, electrochromic devices such as smart windows and flat panel displays.
ADVANTAGE - The solid gel **membranes** are much easier, less expensive and function efficiently at room temperature as compared to prior art. The measured ionic conductivity is much higher as compared to prior art. The gel **membrane** protects **anode** from corrosion and prevents zinc oxidation product from the **anode** from contaminating the electrolyte.
DESCRIPTION OF DRAWING(S) - The figure shows a rechargeable metal/air **battery** having three **electrodes**, a porous spacer a solid gel **membrane** incorporated as a separator
metal **anode** 20
air **cathode** 40
porous spacer 50
separator 60
liquid aqueous electrolyte 80
housing 90
Dwg.6/7
FS CPI EPI GMPI
FA AB; GI
MC CPI: A02-A00A; A04-D01; A04-F04; A04-F05; A12-E09; A12-E11A; L03-E05
EPI: S03-E03C; U14-K02; V07-K01A; V07-K04; X12-D01C; X16-A01B; X16-B01; X16-C; X16-D01; X16-F02; X25-U01

=> d L66 1-24 ti

L66 ANSWER 1 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Preparation method of lithium secondary **battery** using gel-type polymer electrolyte.

L66 ANSWER 2 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Graft polymeric **membranes**, for e.g. ion-exchange **membranes** used in e.g. an **electrochemical fuel cell**, comprises one or more trifluorovinyl aromatic monomers, radiation graft polymerized to a polymeric base film.

L66 ANSWER 3 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Sulfonic acid group-containing polyvinyl alcohol useful for producing composite polymer **membrane** used as an **electrode** for **fuel cells** has sulfonic acid group-containing side chains and crosslinked structures.

L66 ANSWER 4 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Ion exchange **membrane** used as diaphragm in dialysis, is formed by heating membranous substance formed from dispersion of fluororesin microparticle, ion exchange property polymer and fluorine containing surfactant.

L66 ANSWER 5 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI High proton conductance, solid polymer electrolyte **membrane** for use in a proton-exchange **membrane fuel cell**

comprises a sulfonated phosphazene polymer which is **chemically** or physically **cross-linked**.

L66 ANSWER 6 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Composite of polysilamine and strong acid for use as electrolyte **membrane** of **fuel cell**.

L66 ANSWER 7 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Gel-like solid polymer electrolyte for **batteries** - is formed by heat hardening pre-gel solution comprising **polymerisable compound**, electrolyte and initiator in outer cladding object.

L66 ANSWER 8 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Stabilising a polymeric film of an **electrochemical cell** against degradation - involves including a polyhydroxylic aromatic **crosslinking agent** in the cell and heating to vulcanise the vinylidene fluoride copolymer film.

L66 ANSWER 9 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Sodium peroxo di sulphate and sodium hydroxide production by **electrolysis** - using **cell** in which **cathode** and **anode** chambers are separated by cation exchange **membrane** giving high current efficiency.

L66 ANSWER 10 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Gas-generating **electrochemical cell** to power dispensing of liquid - with sealed **cathode** compartment containing electrolyte and reducible metal oxide, **anode** compartment generating gas, and **separators**.

L66 ANSWER 11 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI High purity vanadium electrolytic solution production - comprising purificn. step, de-ammoniation step, trivalent vanadium cpd. forming step, etc., for use in redox **battery**.

L66 ANSWER 12 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Polymer **membrane**, for nonlinear optical device - obtd. by oxidising pyrrole cpd. on polymer substrate and electrochemically polymerising for oriented stable shield material.

L66 ANSWER 13 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Electroconductive organic polymer **membrane** production - involving mixing a monomer opt. dissolved in solvent with oxidant and binder polymer, spreading on base material and oxidation polymerising.

L66 ANSWER 14 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Soluble, electroconductive poly-3-alkoxy thiophene production - by anodic polymerisation of 3-alkoxy thiophene in cell with stirred anolyte, separated from catholyte by ion-exchange **membrane**.

L66 ANSWER 15 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Electrochemical cell** for carbon-di oxide detection - in presence of oxygen and water, comprises sample-chamber, barrier-**membrane electrodes**, especially gold, and non-aqueous aprotic, gelled electrolyte.

L66 ANSWER 16 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Conductive polymer compsns. - obtd. by **polymerising** aromatic

compound in presence of polymer containing poly dentate anionic complex.

L66 ANSWER 17 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI New iso thianaphthene polymers useful in electrochromic display - prepared from iso thianaphthene cpds., di hydro iso thianaphthene-5-oxide or by dehydrogenation of poly di hydro iso thianaphthene.

L66 ANSWER 18 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Ion exchange **membrane** comprising fluorocarbon polymer - grafted and crosslinked, used in **electrolysis cells**.

L66 ANSWER 19 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Battery separator** for alkaline cell - has coating of polyvinyl alcohol applied from aqueous dispersion and crosslinked.

L66 ANSWER 20 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Zinc alkaline **battery** - with alkaline electrolyte on zinc **anode** side of zinc oxide-impermeable **membrane**, saturated with zinc oxide.

L66 ANSWER 21 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Electric **battery** contg a porous positive **electrode** - covered with a semipermeable **membrane** pref insolubilised polyvinyl alcohol.

L66 ANSWER 22 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Separators** for alkaline **batteries** - having various **electrode** systems.

L66 ANSWER 23 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Vinyl acetate-ethylene copolymer/cellop- - hane laminates as **battery separator** materi.

L66 ANSWER 24 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Electro-chemical **electrode** with a polymeric hydrophitic.

=> d L66 1-3,5-8,12-13,16-24 all

L66 ANSWER 1 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2002-390393 [42] WPIX
DNC C2002-109937
TI Preparation method of lithium secondary **battery** using gel-type polymer electrolyte.
DC A85 L03 X16
IN CHO, M D
PA (SMSU) SAMSUNG SDI CO LTD
CYC 1
PI KR 2001100242 A 20011114 (200242)* 1 H01M010-38
KR 327492 B 20020313 (200263) H01M010-38
ADT KR 2001100242 A KR 2000-15032 20000324; KR 327492 B KR 2000-15032 20000324
FDT KR 327492 B Previous Publ. KR 2001100242
PRAI KR 2000-15032 20000324
IC ICM H01M010-38

AB KR2001100242 A UPAB: 20020704
NOVELTY - A method for preparing a lithium secondary **battery** is provided, which uses a gel-type polymer electrolyte to form an **electrode** and an electrolyte in one body for improving the mechanical properties and to trap an electrolyte solution stably for preventing the leakage of liquid.

DETAILED DESCRIPTION - The method comprises the steps of: directly coating or casting a **cathode** active material or an **anode** active material on a current collector to make a **cathode** plate or an **anode** plate; intervening a porous **membrane** between the **cathode** plate and the **anode** plate to for an **electrode** assembly; inserting the **electrode** assembly into a **battery** case; injecting an electrolyte forming composition comprising a non-aqueous organic electrolyte, a **cross -linking agent**, a **polymerization** initiator and optionally a polymer or a vinyl-based monomer, into the **battery** case; and heating the **battery** case or irradiating light to it to allow the cross-linking to be formed between the **cross-linking agents** or the **cross-linking agent** and a polymer or a vinyl-based monomer.

Preferably the polymer is selected from the group consisting of poly(ethylene oxide), poly(vinyl pyrrolidone), poly(acrylonitrile), a terpolymer of acrylonitrile-methyl methacrylate- styrene and their mixtures, and the vinyl-based monomer is selected from the group consisting of vinyl acetate, 2-vinyl-2,3-dioxolane, acrylomorphorine, vinyl methacrylate and their mixtures.

Dwg.1/10

FS CPI EPI
FA AB; GI
MC CPI: A02-A00A; A08-C01; A08-D01; A11-C02; A11-C02B; A12-E06; L03-E01C3
EPI: X16-E01G; X16-E08A; X16-J01A; X16-J08

L66 ANSWER 2 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2001-602350 [68] WPIX
CR 1999-347271 [29]; 2003-074991 [07]
DNN N2001-449491 DNC C2001-178387
TI Graft polymeric **membranes**, for e.g. ion-exchange **membranes** used in e.g. an **electrochemical fuel cell**, comprises one or more trifluorovinyl aromatic monomers, radiation graft polymerized to a polymeric base film.
DC A18 A85 A88 J01 J03 J04 L03 S03 X16 X25
IN CHOUDHURY, B; STECK, A E; STONE, C
PA (BALL-N) BALLARD POWER SYSTEMS INC
CYC 93
PI WO 2001058576 A1 20010816 (200168)* EN 47 B01D067-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000034134 A 20010820 (200175) B01D067-00
EP 1257348 A1 20021120 (200301) EN B01D067-00
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
JP 2003522224 W 20030722 (200350) 42 C08J007-16
ADT WO 2001058576 A1 WO 2000-CA337 20000329; AU 2000034134 A AU 2000-34134

20000329; EP 1257348 A1 EP 2000-912309 20000329, WO 2000-CA337 20000329; JP 2003522224 W WO 2000-CA337 20000329, JP 2001-557676 20000329
FDT AU 2000034134 A Based on WO 2001058576; EP 1257348 A1 Based on WO 2001058576; JP 2003522224 W Based on WO 2001058576
PRAI US 2000-503760 20000214
IC ICM B01D067-00; C08J007-16
ICS B01D061-42; B01D071-34; B01D071-36; B01D071-78; B01D071-82; B01J041-14; B01J047-12; C08F291-00; C08J005-22; C25B013-08; H01M008-02; H01M008-10
ICI C08L101:00
AB WO 200158576 A UPAB: 20030805
NOVELTY - Graft polymeric **membranes**, comprise one or more alpha , beta , beta -trifluorovinyl aromatic monomers of specified formulae, radiation graft polymerized to a polymeric base film.

DETAILED DESCRIPTION - A **membrane** (M) comprising a polymeric base film, onto which either monomer(s) of formulae (I) and (II) have been graft polymerized, or chains comprising (I) and (II) as monomer units have been grafted.

A1, A2, B1, B2 = H, lower alkyl, lower fluoroalkyl, cyclic alkyl, aryl (other than Ph), CH(X)Ph, PRR', and P(OR)(OR'), (provided that at least one the substituents does not equal H, to enable graft polymerization);

X = F, lower alkyl, lower fluoro alkyl or Ph; and

R, R' = lower alkyl, cyclic alkyl or Ph.

INDEPENDENT CLAIMS are also included for:

(1) the preparation of the **membrane** (M), comprising graft **polymerizing compounds** (I) or (II) onto a polymeric base film;

(2) the preparation of a **membrane** (M1) comprising subjecting **membrane** (M) to halomethylation, sulfonation, phosponation, amination, carboxylation, hydroxylation or nitration; and

(3) the preparation of a **membrane** (M2), comprising graft **polymerizing compounds** of formula (I) or (II) onto a polymeric base film where A1 and B1 = SR (S = sulfur), where a portion of the SR groups are converted (oxidized) to sulfonate or sulfonic acid groups.

USE - As an ion-exchange **membrane** (claimed) for use in an **electrode** apparatus, a **membrane electrode** assembly and an **electrochemical fuel cell** (all claimed). The **membrane** may also be used in: filtration and ultrafiltration; proton exchange **membranes** in water electrolysis; **membranes** in chloralkali electrolysis; **electrode separators** in conventional **batteries**; ion-selective **electrodes**; sensor materials for humidity sensors; ion exchange chromatography; analytical pre-concentration techniques (e.g. Donnan Dialysis); electrodialysis; hemodialysis; removal of alcohol from beer; gas separation and pervaporation techniques; and bipolar **membranes** in water splitting and the subsequent recovery of acids and bases.

ADVANTAGE - The activated, substituted monomers have increased reactivity (i.e. % graft yield or rate of the polymerization reaction is increased). The substituent are activating to the polymerization reaction, and can be converted to be deactivating to subsequent reaction, so introducing ion-exchange functionality to the grafted chains. The ion-exchange groups are more stable under certain conditions than prior art **membranes**. More than one ion-exchange group per grafted monomer unit can be introduced, enabling the higher ion-exchange capacities at lower percentage grafts. Cation and anion-exchange groups

may be incorporated. The chains may be crosslinked to provide greater dimensional stability.

DESCRIPTION OF DRAWING(S) - The drawing shows the polarization plots of voltage as a function of current density of a **fuel cell** utilizing a sulfonated para-methyl- alpha , beta , beta -trifluorostyrene-grafted ion-exchange **membrane.**

Dwg.2/2

FS CPI EPI
FA AB; GI
MC CPI: A04-C; A04-E10D; A10-C03A; A12-E06; J01-C03; J01-C03B1; J01-D04; J01-E02C; J01-E03E; J03-B03A; J03-D; J04-C02; L03-E01A; L03-E04
EPI: S03-E03; S03-F09; X16-B01; X16-C01C; X16-E06A; X16-F02; X25-R01C

L66 ANSWER 3 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2001-318858 [34] WPIX
DNN N2001-229173 DNC C2001-098310
TI Sulfonic acid group-containing polyvinyl alcohol useful for producing composite polymer **membrane** used as an **electrode** for **fuel cells** has sulfonic acid group-containing side chains and crosslinked structures.
DC A14 A85 L03 X16
IN AKITA, H; ICHIKAWA, M; IGUCHI, M; OYANAGI, H
PA (HOND) HONDA GIKEN KOGYO KK; (HOND) HONDA MOTOR CO LTD
CYC 27
PI EP 1085051 A1 20010321 (200134)* EN 12 C08L029-04
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
JP 2001158806 A 20010612 (200139) 8 C08F008-36
US 6523699 B1 20030225 (200323) B01D029-00
ADT EP 1085051 A1 EP 2000-120461 20000919; JP 2001158806 A JP 2000-268736 20000905; US 6523699 B1 US 2000-664088 20000918
PRAI JP 1999-265115 19990920
IC ICM B01D029-00; C08F008-36; C08L029-04
ICS B01D039-00; B01D071-38; B32B007-02; B32B027-30; C08F016-06; C08J003-24; C08K005-41; H01M008-02; H01M008-10
AB EP 1085051 A UPAB: 20010620
NOVELTY - Sulfonic acid group-containing polyvinyl alcohol has sulfonic acid group-containing side chains and crosslinked structures.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a solid polymer electrolyte comprising the sulfonic acid group-containing polyvinyl alcohol; and

(2) a composite polymer **membrane** in which a **membrane** of the sulfonic acid group-containing polyvinyl alcohol is formed on a surface of a water-absorptive or hydrophilic polymer **membrane**; and

(3) an **electrode** comprising the solid polymer electrolyte and fine catalyst particles carried on porous particles.

USE - Sulfonic acid group-containing polyvinyl alcohol for producing composite polymer **membrane**, which is used as an **electrode** for **fuel cells**.

ADVANTAGE - The composite polymer **membrane** has excellent proton conductivity and methanol barrier property. The **fuel cells** have excellent catalytic activity.

Dwg.0/0

FS CPI EPI
FA AB
MC CPI: A10-E09B; A11-C02; A12-E06B; A12-M04; L03-E04B

EPI: X16-C01C; X16-E06A; X16-J01A

L66 ANSWER 5 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2001-146763 [15] WPIX
DNN N2001-107462 DNC C2001-043346
T1 High proton conductance, solid polymer electrolyte **membrane** for use in a proton-exchange **membrane fuel cell** comprises a sulfonated phosphazene polymer which is **chemically** or physically **cross-linked.**
DC A26 A85 L03 W06 X16
IN PINTAURO, P N; TANG, H
PA (TULA) TULANE EDUCATIONAL FUND
CYC 90
PI WO 2000072395 A2 20001130 (200115)* EN 49 H01M008-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000070495 A 20001212 (200115) H01M008-00
US 6365294 B1 20020402 (200226) H01M008-10
ADT WO 2000072395 A2 WO 2000-US11901 20000428; AU 2000070495 A AU 2000-70495 20000428; US 6365294 B1 US 1999-302879 19990430
FDT AU 2000070495 A Based on WO 2000072395
PRAI US 1999-302879 19990430
IC ICM H01M008-00; H01M008-10
AB WO 200072395 A UPAB: 20010317
NOVELTY - A high proton conductance, solid polymer electrolyte **membrane** comprises a sulfonated phosphazene polymer which is **chemically** or physically **cross-linked.**
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a hydrogen or direct liquid-feed methanol **fuel cell** comprising an **anode, cathode** and sulfonated phosphazene polymer electrolyte **membrane** operating in a hydrated state.
USE - The **membrane** is used in proton-exchange **membrane fuel cells**, e.g. hydrogen/oxygen and direct liquid-feed methanol **fuel cells**, as power generators for terrestrial and space applications.
ADVANTAGE - The **membrane** has a high proton conductance and low water and methanol permeation rates.
Dwg.0/6
FS CPI EPI
FA AB
MC CPI: A10-E12A; A11-C02B; A12-E06B; L03-E04
EPI: W06-B03B; X16-C01C; X16-J01A

L66 ANSWER 6 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1999-593304 [51] WPIX
DNN N1999-437866 DNC C1999-173475
TI Composite of polysilamine and strong acid for use as electrolyte **membrane** of **fuel cell.**
DC A26 A85 E11 L03 X16
IN OGATA, N
PA (AVET) AVENTIS RES & TECHNOLOGIES GMBH & CO KG
CYC 27
PI EP 954041 A2 19991103 (199951)* EN 32 H01M008-10

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
JP 11323137 A 19991126 (200007) 17 C08L083-16
US 6174615 B1 20010116 (200106) H01M008-10
ADT EP 954041 A2 EP 1999-107866 19990421; JP 11323137 A JP 1998-122403 19980501; US 6174615 B1 US 1999-301845 19990429
PRAI JP 1998-122403 19980501
IC ICM C08L083-16; H01M008-10
ICS C08G077-62; C08L079-02; H01M008-02
AB EP 954041 A UPAB: 19991207
NOVELTY - The composition of composite is new and contains strong acid retained in polysilamine by a chemical bond.
DETAILED DESCRIPTION - The composite comprises: a) Polysilamine having repeated unit of formula (-N(R1)-A1-Si(R2)(R3)-B-)n (I)
R1, R2 and R3 = same or different H or lower alkyl;
A1 = lower alkylene group which may be substituted by lower alkyl group, a group -A2-N(R4)-A3- or a group -A2-N(R4)-A3-N(R5)-A4-;
A2, A3 and A4 = same or different lower alkylene group which may be substituted by lower alkyl group;
R4 and R5 = same or different, H or lower alkyl group;
B = lower alkylene group which may be substituted by lower alkyl group;
n = at least 2
and b) strong acid.
INDEPENDENT CLAIMS are also included for: 1) Electrolyte **membrane** formed of composite as claimed in the shape of a **membrane**; and 2) a **fuel cell** having number of unit cells, each **cell** with **electrolyte membrane** as claimed in (1), and a pair of **electrodes** having electrolyte **membrane** between them.
USE - The composite can be used as polymeric electrolyte **membrane** of a **fuel cell** used in electric power production, also in display elements, electrochromic elements and various sensors, and also as dispersing agent, emulsifier, water treating agent, water holding agent, thickener, fiber treatment agent and ion exchange resin.
DESCRIPTION OF DRAWING(S) - The drawing shows explanatory cross-sectional view of unit **cell** of **fuel cell**
.
Unit cell 10
Electrolytic **membrane** 12
Catalyst layer 14
Electrode 20
Gas diffusion layer 22
Dwg.1/18
FS CPI EPI
FA AB; GI; DCN
MC CPI: A10-E20; A12-E06B; E05-E02A; E31-K05A; L03-E04
EPI: X16-C01C; X16-J

L66 ANSWER 7 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1999-499815 [42] WPIX
DNN N1999-372975 DNC C1999-146699
TI Gel-like solid polymer electrolyte for **batteries** - is formed by heat hardening pre-gel solution comprising **polymerisable compound**, electrolyte and initiator in outer cladding object.
DC A85 E19 L03 X12 X16
PA (SAOL) SANYO ELECTRIC CO LTD

CYC 1
PI JP 11214038 A 19990806 (199942)* 8 H01M010-40
ADT JP 11214038 A JP 1998-12211 19980126
PRAI JP 1998-12211 19980126
IC ICM H01M010-40
ICS H01B001-12
ICA C08F002-02; C08F004-34
AB JP 11214038 A UPAB: 19991026
NOVELTY - The electrolyte is formed by heat hardening a pre-gel solution containing a **polymerisable compound**, an electrolyte and a specific initiator accommodated in an outer cladding object (3).

DETAILED DESCRIPTION - The electrolyte is formed by heat hardening a pre-gel solution containing a **polymerisable compound**, an electrolyte and an initiator, selected from 1,1,3,3-tetramethyl butylperoxy neodecanoate, t-butylperoxy neodecanoate, t- hexylperoxy pivalate, t-hexylperoxy 2-ethyl hexanoate, t-hexylperoxy isopropyl monocarbonate, t-hexylperoxy benzoate or t-hexylperoxy neodecanoate, accommodated in an outer cladding object (3).

An INDEPENDENT CLAIM is also included for the production of a gel-like solid polymer electrolyte. A porous **membrane** is interposed between the **electrodes** placed in the outer cladding object. Subsequently, the pre-gel solution is injected inside the outer cladding object and gelled.

USE - For **batteries**.

ADVANTAGE - The gel-like solid polymer electrolyte is highly efficient and has good discharge capacitance. Deterioration of cyclic characteristic is reduced.

DESCRIPTION OF DRAWING(S) - The figure is a front elevation of the **battery** comprising a flat aluminium laminated material containing the gel-like solid polymer electrolyte. (1) **Anode** collector; (2) **Cathode** collector; (3) Outer cladding object.

Dwg.1/3
FS CPI EPI
FA AB; GI; DCN
MC CPI: A11-C02; A12-E06; E10-A04B; L03-E01B9
EPI: X12-D01C; X16-B01F; X16-J01C; X16-J08

L66 ANSWER 8 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1999-181232 [15] WPIX
DNN N1999-133043 DNC C1999-052987
TI Stabilising a polymeric film of an **electrochemical cell** against degradation - involves including a polyhydroxylic aromatic **crosslinking agent** in the cell and heating to vulcanise the vinylidene fluoride copolymer film.
DC A14 A85 E19 L03 X16
IN BARKER, J; KELLEY, T E; MITCHELL, P H
PA (VALE-N) VALENCE TECHNOLOGY INC
CYC 82
PI WO 9909604 A1 19990225 (199915)* EN 37 H01M002-16
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM GW HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW
AU 9881613 A 19990308 (199929) H01M002-16
EP 1008196 A1 20000614 (200033) EN H01M002-16
R: GB IE

US 6077624 A 20000620 (200035) H01M004-62
EP 1146585 A2 20011017 (200169) EN H01M010-40
R: GB IE
ADT WO 9909604 A1 WO 1998-US13019 19980619; AU 9881613 A AU 1998-81613 19980619; EP 1008196 A1 EP 1998-931498 19980619, WO 1998-US13019 19980619; US 6077624 A US 1997-911476 19970814; EP 1146585 A2 Div ex EP 1998-931498 19980619, EP 2001-201816 19980619
FDT AU 9881613 A Based on WO 9909604; EP 1008196 A1 Based on WO 9909604; EP 1146585 A2 Div ex EP 1008196
PRAI US 1997-911476 19970814
IC ICM H01M002-16; H01M004-62; H01M010-40
ICS H01M006-18
AB WO 9909604 A UPAB: 19990416
NOVELTY - A method for stabilising a polymeric film of an **electrochemical cell**, comprising a copolymer of vinylidene fluoride (VDF) and another fluorinated monomer(s), comprises including in the cell a polyhydroxylic aromatic **crosslinking agent** and heating the cell to vulcanise the copolymer and so stabilise it against degradation during operation of the cell.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following: (a) a **battery** comprising a positive **electrode** element, a negative **electrode** element, and a **separator membrane** element placed between the **electrode** elements, where an element(s) is formed with a polymeric binder which comprises a copolymer of VDF, another fluorinated monomer(s) (OFM(s)), and a **crosslinking agent** for the copolymer; and (b) a **battery** cell assembly comprising positive and negative **electrodes** and a **separator membrane**, in which the **separator membrane** comprises a polymeric material comprising a copolymer of at least 93 weight% VDF and up to 7 weight% hexafluoropropylene (HFP).
USE - In rechargeable lithium cells.
ADVANTAGE - The methods and compositions reduce the reactivity of VDF-based copolymers to lithiated graphite, preventing degradation, large exothermic reaction and evolution of gaseous and acidic materials, and provide **batteries** having improved charging and discharging characteristics, which maintain integrity over a prolonged life cycle.
Dwg.0/5
FS CPI EPI
FA AB; DCN
MC CPI: A04-E10B; A08-C; A11-C02; A12-E06A; E05-G02; E05-G03D; E10-E02D; E10-E02D3; E10-E02D4; L03-E01
EPI: X16-B01F1; X16-E09; X16-F02; X16-K

L66 ANSWER 12 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1992-189818 [23] WPIX
DNC C1992-086948
TI Polymer **membrane**, for nonlinear optical device - obtd. by oxidising pyrrole cpd. on polymer substrate and electrochemically polymerising for oriented stable shield material.
DC A26 A85 L03
PA (NIPS) NIPPON SODA CO
CYC 1
PI JP 04126728 A 19920427 (199223)* 5 C08J005-18
ADT JP 04126728 A JP 1990-246339 19900918
PRAI JP 1990-246339 19900918
IC ICM C08J005-18
AB JP 04126728 A UPAB: 19931006

Membrane is obtd. by contacting pyrrole cpd. of formula (I) or mixture of cpds. (I: R1 is H atom or alkyl, (substd.) phenyl, or (substd.) benzyl gp.; R2 is H atom or alkyl, (substd.) phenyl, or (substd.) benzyl gp., either of R1 and R2 is long-chain substit.) with uniform, stable solution containing oxidising agent and solvent dissolving these, applying solution onto substrate and (a) evaporating solvent or (b) electromechanical **polymerising**. Oxidising **agent** is e.g. FeCl3, CuCl2, Fe(NO3)3, etc., while substrate is e.g. glass plate, metal, polymer films, ceramic plates, etc. Electrochemical polymerisation comprises e.g. adding monomer to electrolytic solution and applying voltage in **electrolytic cell** with platinum, ITO deposited glass plate to form polymer **membrane** on **anode**.

USE/ADVANTAGE - Improved stability and anisotropic conductivity, used as shield material.

0/9

FS CPI
FA AB; GI
MC CPI: A05-J; A09-A02A; A09-A03; A10-D; A11-B05C; A12-E11; L03-A02A; L03-G02

L66 ANSWER 13 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1992-126554 [16] WPIX
DNN N1992-094268 DNC C1992-059082
TI Electroconductive organic polymer **membrane** production - involving mixing a monomer opt. dissolved in solvent with oxidant and binder polymer, spreading on base material and oxidation polymerising.
DC A28 A85 L03
PA (SEIZ-I) SEIZO M
CYC 1
PI JP 04068032 A 19920303 (199216)* 7
JP 3048603 B2 20000605 (200032) 6 C08J005-18
ADT JP 04068032 A JP 1990-183445 19900710; JP 3048603 B2 JP 1990-183445 19900710
FDT JP 3048603 B2 Previous Publ. JP 04068032
PRAI JP 1990-183445 19900710
IC C08J005-18
ICM C08J005-18
AB JP 04068032 A UPAB: 20000706
Solution (a) is an oxidant and a binder polymer dissolved in the same solvent or different solvents. Solution (b) is a monomer or a monomer dissolved in a solvent. (a) and (b) are mixed and spread on a base material. The mixture solution is polymerised by controlling the oxidation potential to give electroconductive polymer.

Polymerisation on the base board is done while evaporating the solvent. Control of the oxidation potential is done by adding the reduced prod. of the oxidant to the oxidant. The monomer is a cpd. which makes conjugate chains when oxidation polymerised e.g. pyrroles, furanes, thiophenes, anilines or benzidines. The oxidant is Fe (III) salts, Mo (V) salts or Ru (III) salts for pyrroles, furanes and thiophenes, and chromate (IV), bichromate (VI) or permanganate (VII) for anilines or benzidines. The solvent is water, alcohols, aromatic hydrocarbons, ethers, hydrocarbon halides or ketones.

USE/ADVANTAGE - Used as condenser **electrode**, **battery**, **electrode** material, electroconductive film, electroconductive circuit of printed board, lightweight electric wire, electromagnetic shield material, electroconductive filler, antistatic material. The **membrane** is simply prepared by **chemical**

oxidative **polymerisation**. (0/0)
0/0
FS CPI
FA AB
MC CPI: A09-A03; A11-B04; A12-E01; A12-W11A; L03-A02D

L66 ANSWER 16 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1989-087498 [12] WPIX
DNN N1989-066733 DNC C1989-038695
TI Conductive polymer compsns. - obtd. by **polymerising** aromatic **compound** in presence of polymer containing poly dentate anionic complex.
DC A26 A85 L03 X12
IN ELFFIER, J; EIFFLER, J
PA (DOWC) DOW CHEM CO
CYC 19
PI EP 308109 A 19890322 (198912)* EN 20
R: AT BE CH DE ES FR GB GR IT LI NL SE
NO 8804102 A 19890410 (198920)
GB 2210044 A 19890601 (198922)
AU 8821963 A 19890316 (198924)
FI 8804248 A 19890317 (198927)
JP 01158067 A 19890621 (198931)
NO 9200570 A 19890317 (199222) C08F271-00
CA 1325074 C 19931207 (199404) C08G061-12
NO 174297 B 19940103 (199406) C08F008-00
EP 308109 B1 19940914 (199435) EN 6 C08G061-12
R: AT BE CH DE ES FR GB GR IT LI NL SE
DE 3851499 G 19941020 (199441) C08G061-12
ADT EP 308109 A EP 1988-308120 19880901; GB 2210044 A GB 1988-21750 19880916; JP 01158067 A JP 1988-232140 19880916; NO 9200570 A Div ex NO 1988-4102 19880915, NO 1992-570 19920213; CA 1325074 C CA 1988-577486 19880915; NO 174297 B NO 1988-4102 19880915; EP 308109 B1 EP 1988-308120 19880901; DE 3851499 G DE 1988-3851499 19880901, EP 1988-308120 19880901
FDT NO 174297 B Previous Publ. NO 8804102; DE 3851499 G Based on EP 308109
PRAI GB 1987-21750 19870916
REP US 4604427; US 4617353; WO 8505728; EP 104726
IC ICM C08F008-00; C08F271-00; C08G061-12
ICS C08F273-00; C08F275-00; C08F289-00; C08J005-22; C08L039-00; C08L065-00; C08L079-00; C08L101-00; C25B011-04; C25C007-02; D21H003-38; H01B001-12; H01L029-28; H01L031-08; H01M004-04; H05B003-14
AB EP 308109 A UPAB: 19930923
An electrically conductive polymer compsn. is prepared by **polymerising** an aromatic **compound** in the presence of a polymer (I) containing a polydentate anionic complex having a redox potential sufficient for oxidative polymsn. of the aromatic cpd.

Alternatively the oxidative polymsn. can be carried out in the presence of an oxidising agent containing a polydentate anionic complex and a polymer containing anions which are spontaneously exchangeable with the polydentate anionic complex.

USE/ADVANTAGE - The conductive polymer compsn. is used as an electrical conductor or semi-conductor, as an **electrode** material, in a solar cell, as an antistatic finish for plastics or paper, as an electromagnetic shielding material, as an electrochemical **membrane**, in a heating film, for capacitive scanning or in a **fuel cell**.
0/0

FS CPI EPI
FA AB
MC CPI: A05-J; A05-J01; A08-S04; A09-A03; A10-D; A10-E01; A12-E01; L03-A02D; L03-E01B9; L03-E04; L03-G; L04-A04
EPI: X12-D01C

L66 ANSWER 17 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1985-318453 [51] WPIX
CR 1988-184578 [27]; 1988-285304 [40]
DNN N1985-236699 DNC C1985-137528
TI New iso thianaphthene polymers useful in electrochromic display - prepared from iso thianaphthene cpds., di hydro iso thianaphthene-5-oxide or by dehydrogenation of poly di hydro iso thianaphthene.
DC A26 A85 L03 P81 U11 U14 X12
IN WUDL, F; HEEGER, A; KOBAYASHI, M
PA (REGC) UNIV CALIFORNIA
CYC 18
PI EP 164974 A 19851218 (198551)* EN 61
R: AT BE CH DE FR GB IT LI LU NL SE
JP 61012784 A 19860121 (198609)#
JP 61017581 A 19860125 (198610)#
US 4640748 A 19870203 (198707)
JP 62024034 B 19870526 (198724)#
CN 85105974 A 19870204 (198817)#
CA 1248690 A 19890110 (198907)
JP 01011207 B 19890223 (198912)#
EP 164974 B 19900523 (199021)
R: AT BE CH DE FR GB IT LI LU NL SE
DE 3577860 G 19900628 (199027)
CN 1045410 A 19900919 (199122)#
CN 1063293 A 19920805 (199316)# C08G079-00
CN 1023527 C 19940112 (199518)# H01M004-60
ADT JP 61012784 A JP 1984-121956 19840615; JP 61017581 A JP 1984-109329 19840531; US 4640748 A US 1985-736984 19850522; CN 1063293 A Div ex CN 1985-105974 19850807, CN 1992-100766 19850807; CN 1023527 C CN 1992-100766 19920209
PRAI US 1984-634805 19840726; US 1985-736984 19850522;
US 1986-937115 19861202; US 1986-944138 19861218;
CN 1985-105974 19850807
REP 3.Jnl.Ref; A3...8651; No-SR.Pub; US 4487667
IC ICM C08G079-00
ICS C08G061-12; C08G075-00; C08J005-18; C09K011-06; C25B003-10; G02F001-17; H01B001-12; H01L025-02; H01M004-02; H01M004-60
AB EP 164974 A UPAB: 19950508
Isothianaphthene polymers of formula (Ia) and/or (Ib): R1 and R2 each are H or 1-5C hydrocarbon or together form, with the benzene ring to which they are attached, naphthalene; X is sulphur, selenium or tellurium; Y is an electrolyte anion; z is a number of 0.01-1, the ratio of anion per mol. of a monomer; and n is 5-500, deg. of polymerisation. (2) Preparation of poly(isothianaphthene) comprising: (a) electrochemical polymerisation of a isothianaphthene cpd. of general formula (IV), R1, R2 and X are as in (1), in the presence of nucleophilic anions; (b) **chemical polymerisation** of isothianaphthene or dihydroisothianaphthene-S-oxide in the presence of cationic polymerisation catalysts; or (c) dehydrogenation of poly(dihydroisothianaphthene).
(3) A high mol. weight conductive **membrane** useful as an electrochromic layer comprising a polymer capable of being reversibly oxidised and reduced which is an isothianaphthene polymer of formula

(III): R1 and R2 are H or 1-5C hydrocarbon; z is 0-0.40, the ratio of anion per isothianaphthene unit; and X, Y- and n are as in (1).

USE - The polymers are useful in electrochromic materials and in solar energy conversion devices.

Dwg.0/7

Dwg.0/7

FS CPI EPI GMPI
FA AB
MC CPI: A05-J; A09-A03; A10-D; A10-E11; A12-E06; A12-E11; A12-L03; L03-D04E; L03-E01B; L03-E05; L03-G05
EPI: U11-A03; U14-K09; X12-D01C

L66 ANSWER 18 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1982-57747E [28] WPIX
TI Ion exchange **membrane** comprising fluorocarbon polymer - grafted and crosslinked, used in **electrolysis cells**.
DC A14 A85 D15 J03 X25
IN BERNARD, M; BONAMOUR, A M; CHAPIRO, A; MAS, L
PA (SRTI) SOC RECH TECH IND SA
CYC 1
PI FR 2494702 A 19820528 (198228)* 10
PRAI FR 1980-24797 19801121
IC C08F259-08; C08J005-22; C08J007-18; C25B013-08
AB FR 2494702 A UPAB: 19930915
An ion exchange **membrane** comprising a fluorocarbon polymer fabric or film is improved by being both grafted and crosslinked. The polymer is pref. PTFE, the grafted monomer is pref. acrylic acid, the **crosslinking agent** is pref. difunctional (pref. ethylene glycol dimethacrylate, DEGMA) or trifunctional (pref. triallylcyanurate, TAC).

Preparation of the **membrane** is also claimed and comprises subjecting a substrate of the polymer to ionising irradiation and then placing it in contact with a reaction medium containing the monomer and the **crosslinking agent** and heating to effect simultaneous grafting and crosslinking.

The **membrane** is used in **electrolysis cells** to separate the **anode** from the **cathode** and is capable of resisting extremely hard operating conditions e.g. high temps. and aggressive chemicals.

FS CPI EPI
FA AB
MC CPI: A04-E09; A04-F04A; A08-C07; A10-C03A; A10-E10; A11-C02; A12-E09; A12-M04; D04-A01G; D04-B10; J01-D04; J03-B03
EPI: X25-R01C

L66 ANSWER 19 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1982-09203J [50] WPIX
TI **Battery separator** for alkaline cell - has coating of polyvinyl alcohol applied from aqueous dispersion and crosslinked.
DC A14 A85 L03 X16
IN BOROVSKY, J; WEBER, R E
PA (KIMB) KIMBERLY CLARK CORP
CYC 1
PI US 4361632 A 19821130 (198250)* 9
PRAI US 1981-266437 19810522
IC H01M002-16
AB US 4361632 A UPAB: 19930915
A **battery separator** (10) for an alkaline

battery cell comprises a flexible fibrous absorber (12) having a moderately used polyvinyl alcohol coating (14). The absorber is resistant to strong alkali and oxidation. The coating (14) is applied from an aqs. dispersion of non-crosslinked polyvinyl alcohol solution, inert hydrophobic fillers, a dispersing agent, a water soluble plasticiser, a low m.weight alcohol, a **crosslinking agent** and a catalyst, the crosslinking being achievable at a desired temperature The polyvinyl alcohol forms a semipermeable **membrane** (14) which is mechanically bonded by entanglement to the absorber (12) in a thin region (16) of the coating.

The **separator** provides low resistance to electrolyte ion transfer but substantial resistance to **electrode** ion transfer during cell operation. Transition from hydrodynamic flow to diffusional flow is effected with very little delay. It is used in high energy density secondary alkaline **batteries** such as Ni-Zn **batteries**.

1/4

FS CPI EPI
FA AB
MC CPI: A10-E09B; A11-B05D; A11-C02C; A12-E06; L03-E01A
EPI: X16-F02

L66 ANSWER 20 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1979-04830B [03] WPIX
TI Zinc alkaline **battery** - with alkaline electrolyte on zinc **anode** side of zinc oxide-impermeable **membrane**, saturated with zinc oxide.
DC A85 L03 X16
PA (HITM) HITACHI MAXELL KK
CYC 1
PI JP 53139132 A 19781205 (197903)*
PRAI JP 1977-53956 19770510
IC H01M006-04
AB JP 53139132 A UPAB: 19930901

Battery comprises a Zn **anode** separated from a **cathode** by a **membrane** which is impermeable to ZnO. Alkaline electrolyte on the **anode** side is saturated with ZnO, and the alkaline electrolyte on the **cathode** side contains <=2 weight % ZnO.

Battery has improved discharged performance and leakage of electrolyte is prevented. In an example, a KOH aqueous solution containing 2 weight % of ZnO was poured into a **cathode** can. A **cathode** was produced by mixing 93 pts. weight of silver oxide and 7 pts. weight of flaky graphite and compacting the mixture and inserted in the can. A **separator** of cellophane and a liquid-holding sheet were placed on the **cathode** and an **anode** placed in the **anode** can. The **anode** was produced by adding a 40 weight % KOH aqueous solution as an electrolyte containing 4 weight % of ZNO to a mixture of amalgamated Zn powder and a **gelling agent** of Na polyacrylate.

FS CPI EPI
FA AB
MC CPI: A12-E06; L03-E02

L66 ANSWER 21 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1976-44332X [24] WPIX
TI Electric **battery** contg a porous positive **electrode** - covered with a semipermeable **membrane** pref insolubilised polyvinyl alcohol.

DC A85 L03 X16
PA (CIPL) CIPEL CIE IND PILES ELECTRIQUE; (ACCF) SAFT SOC ACCUM FIXES TRACTION
CYC 1
PI FR 2283555 A 19760430 (197624)*
PRAI FR 1974-29282 19740827
IC H01M002-14
AB FR 2283555 A UPAB: 19930901
An electric **battery** comprises a metal based negative **electrode** and a porous positive **electrode** at least the ion exchanging surface of which is covered with a semi-permeable **membrane**, pref. made of polyvinyl alcohol, insolubilised by cross-linking. The layer is obtd. by applying a solution containing polyvinyl alcohol, a **cross-linking agent** and an acid cpd. then drying and heating the layer. The provision of the semi-permeable **membrane** overcomes and prevents possible short circuiting due to **electrode** contact.
FS CPI EPI
FA AB
MC CPI: A10-E09B; A12-E06; L03-E01C; L03-E03

L66 ANSWER 22 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1972-22862T [14] WPIX
TI **Separators** for alkaline **batteries** - having various **electrode** systems.
DC A85 L03
PA (GATE) GATES RUBBER CO
CYC 1
PI JP 47004225 A (197214)*
PRAI US 1970-62224 19700803
AB JP 47004225 A UPAB: 19930000
For use in alkaline storage **batteries**, partic. those having **electrode** system such as Ni, Cd, Ni, Zn, Ag, Zn and MnO2-Zn, in which the **separator** must be highly resistant to physical and chemical influences within the cell. Novel construction comprises at least two bibulous, non-**membraneous separator** layers laminated together with a thin layer of a **gelling agent**, which provides mechanical integrity to the **separator** layer and functions as a semi-permeable **membrane**. Alternatively the **separator** comprises bibulous, non-**membraneous separator** layers sandwiching and laminated to a **membraneous** layer utilising a **gelling agent** to provide an integral **separator** of mechanical integrity. These **separators** have particular utility as inter-**electrode** spacers in alkaline **batteries** in which a **separator** resistant to alkaline electrolyte, oxidation, dendrite growth and other degrading cell environmental factors are required.
FS CPI
FA AB
MC CPI: A12-E06; L03-E01A

L66 ANSWER 23 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1971-24614S [14] WPIX
TI Vinyl acetate-ethylene copolymer/cellop- - hane laminates as **battery separator** materi.
DC A11 A17 A85 L03 X16
PA (ESBI) ESB INC

CYC 2
PI US 3573106 A (197114)*
GB 1259051 A (197201)
PRAI US 1968-772776 19681101
IC H01M003-02
AB US 3573106 A UPAB: 19930831
Laminated sheets (I) of semi-permeable **membranes** (II) and absorbent layers (III), as used as barrier materials between the **anode** and **cathode** compartments in electric storage **batteries**, are described. (I) provides for improved cycle life and storage characteristics. (I) comprises a cellophane **membrane** (1-3 mils) laminated to the layer (III) (3-15 mils), which is made up of 10-30% weight vinyl acetate-ethylene copolymer mixed with a starch/flour **gelling agent**. Layer (III) is prepared by methods such that the **gelling agent** is not **gelled** until it is in contact with the electrolyte.
FS CPI EPI
FA AB
MC CPI: A03-A05; A04-G07; A12-E06; L03-E01

L66 ANSWER 24 OF 24 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1968-15453Q [00] WPIX
TI Electro-chemical **electrode** with a polymeric hydrophitic.
DC A00
PA (BECI) BECKMAN INSTR INC
CYC 1
PI GB 1134140 A (196800)*
PRAI US 1965-465128 19650618
AB GB 1134140 A UPAB: 19930831
An **electrode** for measuring the ion concentration of solutions consists of a reference **electrode** of generally normal design and a hydrophillic **membrane** cover. The **electrode** consists of a tube containing an **electrolyte**, a half-**cell** formed by a silver wire, or similar member, with a leak port at the lowest point of the tube. The **membrane** forms a cover over the leak port and permits the passage of the liquid and small ions by diffusion rather than by the movement of liquid.
This **electrode** has a liquid junction structure whose permeability to liquid and ions is based on diffusion rather than on flow of liquid.
FS CPI
FA AB
MC CPI: A03-A01; A03-C01; A04-E02E; A12-E; A12-L04

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FILE COVERS APR 1973 TO JANUARY 29, 2004

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=> d L121 ibib abs ind

L121 ANSWER 1 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 2002-203609 JAPIO
TITLE: CHARGING METHOD FOR NONAQUEOUS ELECTROLYTE SECONDARY **BATTERY**
INVENTOR: NORITOMI YASUKO; SATO ASAKO; SHIMURA NAO; KOZUKA SHOJI; NAKANISHI HIROSHI
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2002203609	A	20020719	Heisei	H01M010-44

APPLICATION INFORMATION
STN FORMAT: JP 2000-402524 20001228
ORIGINAL: JP2000402524 Heisei
PRIORITY APPLN. INFO.: JP 2000-402524 20001228
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002
AN 2002-203609 JAPIO
AB PROBLEM TO BE SOLVED: To provide a manufacturing method for a nonaqueous electrolyte secondary **battery** with high capacity and excellent charge/discharge cycle characteristics.
SOLUTION: The charging method for the nonaqueous electrolyte secondary **battery** provided with a **cathode**, an **anode** containing matter storing and discharging lithium, and nonaqueous electrolyte containing nonaqueous solvent comprises a process in which a **protective membrane** is formed on the surface of the **anode** as the nonaqueous solvent of the nonaqueous electrolyte is made to generate decomposition reaction by making rated voltage charging after rated current charging and a charging process for having the **anode** store lithium.
COPYRIGHT: (C)2002,JPO
IC ICM H01M010-44
ICS H01M010-40

=> d L121 2-18 ibib abs ind

L121 ANSWER 2 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 2001-158806 JAPIO
TITLE: SULFONE GROUP-CONTAINING POLYVINYL ALCOHOL, SOLID POLYMER ELECTROLYTE, POLYMER CONJUGATED **MEMBRANE**, PRODUCTION METHOD THEREFOR AND **ELECTRODE**
INVENTOR: AKITA KOJI; ICHIKAWA MASAO; IGUCHI MASARU; KOYANAGI HIROYUKI
PATENT ASSIGNEE(S): HONDA MOTOR CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001158806	A	20010612	Heisei	C08F008-36

APPLICATION INFORMATION
STN FORMAT: JP 2000-268736 20000905
ORIGINAL: JP2000268736 Heisei
PRIORITY APPLN. INFO.: JP 1999-265115 19990920

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001

AN 2001-158806 JAPIO

AB PROBLEM TO BE SOLVED: To provide a solid polymeric electrolyte having proton conductivity, a polymeric composite **membrane** having excellent proton conductivity and methanol interruption, production thereof, and **electrodes** for **fuel cells** with excellent catalyst activity.
SOLUTION: The objective sulfone group-containing poly(vinyl alcohol) having the crosslinking structures is produced by heat-treatment of a mixed solution of poly(vinyl alcohol), a sulfonation **agent** and a **crosslinking agent**. A water- absorption or hydrophilic polymer **membrane** is coated with the mixed solution, then sulfonated and crosslinked to give the objective polymeric composite **membrane**. Additionally, a sulfone group-bearing polyvinyl alcohol including the crosslinking structure and the **electrodes** including catalyst fine particles carried on porous particles are provided according to this invention.

IC ICM C08F008-36
ICS B32B007-02; B32B027-30; C08J003-24; C08K005-41; C08L029-04; H01M008-02; H01M008-10

L121 ANSWER 3 OF 18 JAPIO (C) 2004 JPO on STN

ACCESSION NUMBER: 2000-251906 JAPIO

TITLE: SOLID POLYMER ELECTROLYTE **MEMBRANE** AND BIPOLAR **MEMBRANE FUEL CELL** USING IT

INVENTOR: OKADA TATSUHIRO; SON RITSUKEN; JOERGEN DAARE; MITSUTA KENRO

PATENT ASSIGNEE(S): AGENCY OF IND SCIENCE & TECHNOL

PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000251906	A	20000914	Heisei	H01M008-02

APPLICATION INFORMATION

STN FORMAT:	JP 1999-52501	19990301
ORIGINAL:	JP11052501	Heisei

PRIORITY APPLN. INFO.: JP 1999-52501 19990301

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000

AN 2000-251906 JAPIO

AB PROBLEM TO BE SOLVED: To obtain a **fuel cell** using a polymer electrolyte **membrane** by forming a joining part of a cation exchange **membrane** and an anion exchange **membrane** with a material constituting the cation exchange **membrane** and the anion exchange **membrane**.
SOLUTION: A cation exchange **membrane** is arranged so as to come in contact with an **anode**, and as the cation exchange **membrane**, an fluorine base ion exchange **membrane** such as a perfluorocarbon sulfonic acid **membrane** or a perfluorocarboxylic acid **membrane**, a phosphoric acid impregnated polybenzimidazole **membrane**, polystyrene sulfonic acid **membrane**, or sulfonated styrene.vinyl benzene copolymer **membrane** is used. As an anion exchange **membrane**, a solid polymer electrolyte **membrane** whose catalyst carried surface is

covered with polyorthophenylene diamine(PPD) by electrolytic polymerization is used. Joining is conducted by thermocompression bonding, a physical means such as mixing, solvent cast, blend, interface **polymerization**, or a **chemical** means such as co-polymerization.
COPYRIGHT: (C)2000,JPO
IC ICM H01M008-02

L121 ANSWER 4 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 2000-106203 JAPIO
TITLE: SOLID POLYMER ELECTROLYTE **MEMBRANE**, **ELECTRODE** FOR **FUEL CELL**, AND SOLID POLYMER **ELECTROLYTE FUEL CELL**
INVENTOR: AKAKABE MICHIO; SHA TAKESHI
PATENT ASSIGNEE(S): AISIN SEIKI CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000106203	A	20000411	Heisei	H01M008-02

APPLICATION INFORMATION
STN FORMAT: JP 1998-278397 19980930
ORIGINAL: JP10278397 Heisei
PRIORITY APPLN. INFO.: JP 1998-278397 19980930
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000
AN 2000-106203 JAPIO
AB PROBLEM TO BE SOLVED: To prevent the deterioration of a hydrocarbon base solid polymer electrolyte **membrane**, realize enhance durability, and reduce cost by adding at least one catalyst selected from among an oxide catalyst, a large cyclic metal complex catalyst, and a transition metal alloy catalyst to the hydrocarbon base solid polymer electrolyte **membrane**.
SOLUTION: A joining body 10 is constituted by interposing a solid polymer electrolyte **membrane** 3 between an oxidizing agent **electrode** 1 and a fuel **electrode** 2, and an oxidizing **agent electrode catalyst** la and a fuel **electrode** catalyst 2b come in contact with the solid polymer electrolyte **membrane** 3 and joined. The joining body 10 is interposed between a **separator** 4a and a **separator** 4b to form a unit cell 20. An oxide catalyst, such as MnO2 decomposes hydrogen peroxide generated in the oxidizing **electrode** 1 in a power generating process and penetrated into the solid polymer electrolyte **membrane** 3 through oxidation- reduction actions with oxygen, and a large cyclic metal complex catalyst, such as iron phthalocyanine and a transition metal alloy catalyst such as an Cu-Ni alloy decompose it by an adsorption-reduction action by transition metal.
COPYRIGHT: (C)2000,JPO
IC ICM H01M008-02
ICS H01M004-86; H01M008-10

L121 ANSWER 5 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 2000-021234 JAPIO
TITLE: SOLID ELECTROLYTIC **MEMBRANE**, MANUFACTURE THEREOF AND **BATTERY** INCORPORATING IT
INVENTOR: HATAYA KOJI

PATENT ASSIGNEE(S): FURUKAWA ELECTRIC CO LTD:THE
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2000021234	A	20000121	Heisei	H01B001-12

APPLICATION INFORMATION
STN FORMAT: JP 1998-184660 19980630
ORIGINAL: JP10184660 Heisei
PRIORITY APPLN. INFO.: JP 1998-184660 19980630
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000

AN 2000-021234 JAPIO
AB PROBLEM TO BE SOLVED: To provide a solid electrolytic **membrane** which has an excellent strength characteristic also compounds with positive **electrodes** and negative **electrodes**, and to provide its manufacture, and to provide a lithium ion secondary **battery** incorporating it.
SOLUTION: In this solid electrolytic **membrane**, void parts in a macromolecular porous **membrane** such as a polyvinylidene fluoride **membrane** are filled with a **gel** material retaining an electrolyte in a network structure of a polyaddition compound of a compound such as a glycolic polymer having two or more hydroxyl groups in a molecule with a compound such as tolylene diisocyanate having two or more **isocyanate** groups in a molecule.

IC ICM H01B001-12
ICS H01M010-40

L121 ANSWER 6 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1999-354129 JAPIO
TITLE: **ELECTRODE CATALYST** COATING **AGENT** FOR **FUEL CELL** AND **MEMBRANE/ELECTRODE** JOINT BODY USING SAME COATING AGENT
INVENTOR: HOSHI NOBUHITO; IKEDA MASANORI; YAMAMOTO FUMIHIKO
PATENT ASSIGNEE(S): ASAHI CHEM IND CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 11354129	A	19991224	Heisei	H01M004-86

APPLICATION INFORMATION
STN FORMAT: JP 1998-172081 19980605
ORIGINAL: JP10172081 Heisei
PRIORITY APPLN. INFO.: JP 1998-172081 19980605
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999

AN 1999-354129 JAPIO
AB PROBLEM TO BE SOLVED: To lower an oxygen-concentration overvoltage when normal-pressure air is supplied and provide a high output voltage, by using a composition comprising a perfluorosulfonic-acid polymer and a fluorine-containing ether compound as an **electrode-catalyst** coating **agent** used for a gas diffusion **electrode**.
SOLUTION: A **membrane/electrode** joint body for a solid

high-polymer type **fuel cell** comprises an ion-exchange **membrane** serving as an electrolyte and a gas diffusion **electrode** jointed to the ion-exchange **membrane**. An **electrode- catalyst** coating **agent** used for the gas diffusion **electrode** contains a perfluorosulfonic-acid polymer of 30 to 95 weight% expressed by an expression I and a fluorine-containing ether compound of 5 to 70 weight% expressed by an expression II. In the expression I, x=0 to 2, y=2 to 3, and n/m=1 to 10. In the expression II, Rf is a perfluoroalkylene group having the C number of 1 to 3, x and y are perfluoroalkyl groups having the C number of 1 to 5, and k is 1 to 100. The gas diffusion **electrode** using the **electrode-catalyst** coating **agent** is used at least on the side of a **cathode**.

IC ICM H01M004-86
ICS C09D127-18; H01M008-10

L121 ANSWER 7 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1991-274678 JAPIO
TITLE: SEALED METALLIC OXIDE-HYDROGEN STORAGE **BATTERY**
INVENTOR: TAKEUCHI YASUHIRO; AWANO JUNJIRO; YAMASHITA YOSHIHARU; KADOUCHI EIJI
PATENT ASSIGNEE(S): MATSUSHITA ELECTRIC IND CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 03274678	A	19911205	Heisei	H01M010-34

APPLICATION INFORMATION
STN FORMAT: JP 1990-76002 19900326
ORIGINAL: JP02076002 Heisei
PRIORITY APPLN. INFO.: JP 1990-76002 19900326
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1991

AN 1991-274678 JAPIO
AB PURPOSE: To prevent the oxidation of hydrogen occluding alloy thereby elongating the life of a **battery** and prevent the rise of the internal pressure of the **battery** by oxygen and hydrogen by arranging a catalyst where the activated carbon consisting of honeycomb structure is arranged in the **battery**.
CONSTITUTION: The ingot of hydrogen occluding alloy in composition of MmNi<SB>4.2</SB>Mn<SB>8.6</SB> (Mm is mesh metal) is stored in a pressure-resistant vessel, where the occlusion and removal of hydrogen are performed, and activation treatment is applied. A proper amount of polyvinyl alcohol is added as a binder to this alloy powder, and those are mixed and mixed in foaming metallic porous substance so as to form a negative **electrode** 1. Sintered nickel is used for a positive **electrode** 2, and the whole is wound in spiral shape with a **separator** 3 between into an **electrode**. Furthermore, a catalyst 6, which has made the honeycomb- shaped activated carbon, where a binding agent, the molding binder, and water are added to the activated carbon and those are formed into honeycomb shape after kneading and are heat-treated, bear Pd as a **catalytic agent** besides, is arranged inside the case 4 through an insulating plate 5, and those are sealed with a sealing plate 7.

IC ICM H01M010-34

L121 ANSWER 8 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1990-309568 JAPIO
TITLE: LITHIUM SECONDARY **BATTERY**
INVENTOR: MIYATA MASAYUKI
PATENT ASSIGNEE(S): BROTHER IND LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 02309568	A	19901225	Heisei	H01M010-40

APPLICATION INFORMATION
STN FORMAT: JP 1989-130794 19890524
ORIGINAL: JP01130794 Heisei
PRIORITY APPLN. INFO.: JP 1989-130794 19890524
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1990

AN 1990-309568 JAPIO
AB PURPOSE: To regenerate a negative **electrode** by providing an auxiliary **electrode** other than a positive **electrode** of a vanadium oxide and a negative **electrode** of lithium, and applying an external power source between the negative **electrode** and the auxiliary **electrode** to make the negative **electrode** start an **anode** reaction when the service life of the **battery** is terminated.
CONSTITUTION: Inside of an armoring tube 1 is separated into three chambers by separators 3, and a positive **electrode** 4 of a vanadium oxide, a negative **electrode** 5 of lithium, and an auxiliary **electrode** 6 are provided in the three chambers soaking in an electrolyte 2. And when the service life of the **battery** is terminated, an external power source 7a is applied between the negative **electrode** 5 and the **electrode** 6 to let flow the external current larger than the current in the discharge, and the negative **electrode** 5 is made to generate an **anode** reaction. As a result, a **protective membrane** attached to the surface of the negative **electrode** 5 is removed together with the dissolution of the lithium, the needle-form lithium covered with the **protective membrane** is also removed, and the negative **electrode** 5 is regenerated. Consequently, the charge and discharge of the **battery** is made possible again, and a lithium secondary **battery** of a long service life can be obtained.

IC ICM H01M010-40
ICS H01M010-38

L121 ANSWER 9 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1989-186766 JAPIO
TITLE: NONAQUEOUS **ELECTROLYTIC SECONDARY CELL**
INVENTOR: TERASHI KAZUO; SAITO TOSHIHIKO; FURUKAWA SANEHIRO
PATENT ASSIGNEE(S): SANYO ELECTRIC CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01186766	A	19890726	Heisei	H01M010-40

APPLICATION INFORMATION
STN FORMAT: JP 1988-6352 19880114
ORIGINAL: JP63006352 Showa
PRIORITY APPLN. INFO.: JP 1988-6352 19880114
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-186766 JAPIO
AB PURPOSE: To improve the cycle property by using a ring-form ether as a solvent and a mixture solute including lithium arsenate hexafluoride as a solute, and specifying the adding amount of the lithium.
CONSTITUTION: A nonaqueous electrolyte which is composed of a mixture solute including lithium arsenate hexafluoride of 10<SP>-7</SP> to 10<SP>-2</SP> mole/l and a ring-form ether is used. As a result, a **protective membrane** is formed on the surface of the lithium negative **electrode**, lithium ions in the charge are separated electrically through the positive membrane, and thereby, an active separated lithium is prevented from contacting directly to the nonaqueous electrolyte, suppressing the reaction with the solvent. The cycle property can be improved accordingly.
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IC ICM H01M010-40

L121 ANSWER 10 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1989-186754 JAPIO
TITLE: NONAQUEOUS ELECTROLYTIC LIQUID SECONDARY **BATTERY**
INVENTOR: TERASHI KAZUO; SAITO TOSHIHIKO; FURUKAWA SANEHIRO
PATENT ASSIGNEE(S): SANYO ELECTRIC CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01186754	A	19890726	Heisei	H01M004-04

APPLICATION INFORMATION
STN FORMAT: JP 1988-6351 19880114
ORIGINAL: JP63006351 Showa
PRIORITY APPLN. INFO.: JP 1988-6351 19880114
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-186754 JAPIO
AB PURPOSE: To improve the cycle property by using a lithium processed by a ring-form ether in which lithium arsenate hexafluoride is solved, as the lithium of a lithium negative **electrode**.
CONSTITUTION: By processing lithium with a ring-form ether in which lithium arsenate hexafluoride is solved, a **protective membrane** is formed on the surface of lithium. By using the lithium processed in such a way as the negative **electrode**, the deposition and the electric separation are generated through the **protective membrane** in the charge and the discharge of the **battery**, and the direct contact of the separated active lithium to the nonaqueous electrolyte is prevented to suppress the reaction with the solvent. The charge and discharge cycle property can be improved consequently.
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IC ICM H01M004-04
ICS H01M004-02

L121 ANSWER 11 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1989-154467 JAPIO
TITLE: LIQUID **FUEL CELL**
INVENTOR: KUMAGAI TERUO; KAMO YUICHI; TAKAHASHI SANKICHI
PATENT ASSIGNEE(S): HITACHI LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01154467	A	19890616	Heisei	H01M008-02

APPLICATION INFORMATION
STN FORMAT: JP 1987-311988 19871211
ORIGINAL: JP62311988 Showa
PRIORITY APPLN. INFO.: JP 1987-311988 19871211
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-154467 JAPIO
AB PURPOSE: To make a cell lightweight, to heighten cell voltage, and to lengthen the life by giving supply and exhaust functions of liquid fuel and oxidizing agent to **electrodes** and by combining them with impermeable **separators**.
CONSTITUTION: **Electrodes** 1, 2 are formed by installing grooves 4 for supplying and exhausting fuel and oxidizing agent on the one side of a conductive porous **substrate** and applying a catalyst such as platinum onto its other side. An electrolyte 3 consists of an ion exchange membrane into which a **sulfuric acid** aqueous solution is **impregnated**. **Separators** 5 are flat plates comprising a mixture of expanded graphite and water repellent material. By using the **electrodes** 1, 2 having electrochemical reaction conducting parts and fuel and oxidizing agent supply and exhaust parts and the electrolyte impermeable **separators** 5, a cell is made compact and cell voltage is heightened, and the life is lengthened.
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IC ICM H01M008-02
ICS H01M004-86

L121 ANSWER 12 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1989-060955 JAPIO
TITLE: SEALED LEAD ACCUMULATOR
INVENTOR: NISHIJIMA MAMORU; HIGASHIMOTO KOJI; HAYAKAWA TAKUMI; MIURA ASAHIKO; KOMAKI AKIO
PATENT ASSIGNEE(S): SHIN KOBE ELECTRIC MACH CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01060955	A	19890308	Heisei	H01M002-16

APPLICATION INFORMATION
STN FORMAT: JP 1987-217165 19870831
ORIGINAL: JP62217165 Showa
PRIORITY APPLN. INFO.: JP 1987-217165 19870831
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-060955 JAPIO
AB PURPOSE: To prolong the life of an accumulator **battery** and make it in large size and with great capacity by installing sandwich-formed

unwoven cloth with specific fiber dia. as the body in the outside and inside of a positive **electrode** plate and a negative **electrode** plate, and by using silicate sol incl. **sulfuric acid** as electrolytic liquid.
CONSTITUTION: Glass mats 1 with glass fiber as the **matrix** with the fiber dia. ranging 10-20μm and a **separator** 2 consisting of synthetic fiber such as polyester fiber and glass fiber with the fiber dia. ranging 1-10μm are installed between a positive **electrode** plate 3 and a negative **electrode** plate 4, and the group of **electrode** plates thus accomplished are accommodated in a **battery** jar 5, and when silicate sol incl. diluted **sulfuric acid** is poured in before it turns into gel, the positive **electrode** plate 3, negative **electrode** plate 4, and **separator** 2 absorb chiefly the **sulfuric acid** in the silicate sol as the small hole has a minor dia., while the glass mats 1 and the gap 6 are filled with silicate sol as the small hole has a major dia. Then the silicate sol is turned into gel to become solid electrolyte 7, and the whole positive **electrode** plate 3 and negative **electrode** plate 4 are utilized.
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IC ICM H01M002-16

L121 ANSWER 13 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1988-000971 JAPIO
TITLE: PHOSPHORIC ACID TYPE **FUEL CELL**
INVENTOR: MITSUTA KENRO; HIRATA IKUYUKI
PATENT ASSIGNEE(S): MITSUBISHI ELECTRIC CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 63000971	A	19880105	Showa	H01M008-02

APPLICATION INFORMATION
STN FORMAT: JP 1986-140175 19860618
ORIGINAL: JP61140175 Showa
PRIORITY APPLN. INFO.: JP 1986-140175 19860618
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1988
AN 1988-000971 JAPIO
AB PURPOSE: To prevent the corrosion of the **electrode** base material fiber and to improve the preservation property of the phosphoric acid, by preventing the **electrode** base material fiber of a wet sealing from coming into direct contact with the phosphoric acid.
CONSTITUTION: A wet sealing consisting of **electrode** base material fibers 1A where a polyethersulfone **membranes** 3 are formed, silicon carbonate micropowder filled between the **electrode** base material fibers, and fillers selected from groups of a **gelled** phosphate **compound** is used. In this case, instead of the silicon carbonate micro-powder, a phosphate compound such as zirconium phosphate can be used.
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IC ICM H01M008-02

L121 ANSWER 14 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1987-291862 JAPIO
TITLE: ENCLOSED NICKEL-HYDROGEN STORAGE **BATTERY**
INVENTOR: SASAKI KUNIHIKO; KANDA MOTOI; YAGASAKI ERIKO; SATO

YUJI
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 62291862	A	19871218	Showa	H01M004-38

APPLICATION INFORMATION
STN FORMAT: JP 1986-134591 19860610
ORIGINAL: JP61134591 Showa
PRIORITY APPLN. INFO.: JP 1986-134591 19860610
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1987

AN 1987-291862 JAPIO
AB PURPOSE: To prolong a **battery** life and prevent rise in **battery** inner pressure, by closely jointing a negative **electrode**, in which hydrogen absorbing alloy powder, **catalyst**, bonding **agent** are contained, with positive **electrode** of nickel oxide, and housing these **electrodes** in a container, and filling with an electrolytic solution, and enclosing the container.
CONSTITUTION: A hydrogen absorbing alloy, a catalyst, and a binder are respectively mixed in the weight ratio of 94:2:4. This mixture is molded into a sheet by using a roller, and then this sheet is cut in a fixed dimension. A nickel net having a lead part serving as a collector is first attached to the one side of this sheet mold by using a press, to manufactire a hydrogen absorbing alloy negative **electrode**. A sintered nickel pole, on the other hand, is prepared as a nickel positive **electrode**. The hydrogen absorbing alloy negative **electrode** and the nickel positive **electrode** are spirally wound with a **separator** interposed, to manufacture an **electrode** group. This **electrode** group is housed in a container made of acryl, and the container is filled with an electrolytic solution and be enclosed. The hydrogen absorbing alloy in the electrolytic solution is prevented from being oxidized to prolong a **battery** life, and besides a rise in **battery** inner pressure, caused by generation of oxygen and hydrogen in the **battery**, can be prevented.

IC ICM H01M004-38
ICS H01M004-62; H01M010-28

L121 ANSWER 15 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1987-262371 JAPIO
TITLE: ORGANIC **ELECTROLYTE CELL**
INVENTOR: WATANABE KIYOTO; TAGOU HIDEYUKI; NAKAI MASAKI; NAKAYAMA RYOICHI
PATENT ASSIGNEE(S): MATSUSHITA ELECTRIC IND CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 62262371	A	19871114	Showa	H01M006-16

APPLICATION INFORMATION
STN FORMAT: JP 1986-105203 19860508
ORIGINAL: JP61105203 Showa
PRIORITY APPLN. INFO.: JP 1986-105203 19860508

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1987

AN 1987-262371 JAPIO

AB PURPOSE: To control a rise of the inner impedance in storing at a high temperature, and to improve the preservation property, by adding lithium fluoride in a cell.
CONSTITUTION: A cell 1 made of a stainless steel has a sealing plate 2 of the same material, and lithium 3 as a negative active substance is attached to the sealing plate 2. A positive **electrode** collector 4 made of titanium is spot- welded to the inner surface of the case 1. A positive **electrode** black mix 5 is made by molding the mixture of carbon fluoride as an active substance, acetylene black, and a fluorine resin binder into pellets. As the electrolyte, is used a solution made by resolving lithium boron-fluolide in a mixture of the same amounts of propylene carbonate and 1, 2-dimethoxyethane. Fluorine ions separated from the lithium fluoride added to the negative active substance, lithium, form a **protective membrane** over the surface of the lithium which is the negative active substance. This membrane prevents the reaction of impurities, peroxide representatively, and the lithium, keeps the activity over the lithium surface, and controls a rise of the inner resistance in storing at a high temperature, resulting in a good preservation property.

IC ICM H01M006-16
ICS H01M004-06

L121 ANSWER 16 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1983-161262 JAPIO
TITLE: **FUEL CELL**
INVENTOR: ENOMOTO KENJI; WADA MATSUNOBU; UOZUMI SHOHEI
PATENT ASSIGNEE(S): HITACHI LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 58161262	A	19830924	Showa	H01M004-86

APPLICATION INFORMATION
STN FORMAT: JP 1982-42668 19820319
ORIGINAL: JP57042668 Showa
PRIORITY APPLN. INFO.: JP 1982-42668 19820319
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1983

AN 1983-161262 JAPIO

AB PURPOSE: To improve the generating performance by splitting a catalyst layer applied on each **electrode** of an unit cell discontinuously thereby uniforming the thickness of the catalyst layer.
CONSTITUTION: An electrolyte layer 5 is held between a fuel **electrode** formed with a gas flow path on one face of an **electrode** basic materil 1 having high conductivity and easy gas diffusion while provided with a catalyst layer 2 having uniform thickness on the other face and an oxide **electrode** to form an unit cell. A plurality of unit cells and **separators** 6 are laminated alternatively to form a **fuel cell**. When arranging a guide 7 on the basic material 1 while developing **catalyst compound** 9 through a doctor blade 8, the catalyst layer 2 having uniform thickness can be obtained. Furthermore it can be standardized such that the guide 7 is made into a sheet and the catalyst layer 2 is punched

and the punching speed is increased. In such a manner the thickness of the catalyst layer to be applied on the **electrode** can be uniformed to improve the cell performance.
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IC ICM H01M004-86

L121 ANSWER 17 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1982-124864 JAPIO
TITLE: GAS DIFFUSION **ELECTRODE** OF **FUEL CELL**
INVENTOR: SAKAI TAKASHI; IDE MASAHIRO; MIYAKE YASUO
PATENT ASSIGNEE(S): SANYO ELECTRIC CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 57124864	A	19820803	Showa	H01M004-96

APPLICATION INFORMATION
STN FORMAT: JP 1981-11009 19810128
ORIGINAL: JP56011009 Showa
PRIORITY APPLN. INFO.: JP 1981-11009 19810128
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1982
AN 1982-124864 JAPIO
AB PURPOSE: To improve electric conductivity and a cell performance by using a graphite inter-layer compound **impregnated** with an acid as a **substrate** of its catalyst layer for a gas diffusion **electrode** of a **fuel cell**.
CONSTITUTION: Negative and positive gas diffusion **electrodes** N, P are composed of a catalyst layer 1 using a graphite inter-layer compound as a **substrate**, and a diffusion layer 2 made of waterproofing carbon paper. Gas **separators** S made of carbon and incorporating gas feed paths 3, 4 for hydrogen and oxygen respectively and a **matrix** E holding a phosphoric acid electrolyte are laid between the negative and positive gas diffusion **electrodes** N, P to make up a **matrix** type **fuel cell**. A graphite inter-layer compound, used as **the substrate** of the catalyst layer 1 for the gas diffusion **electrodes** N, P, is **impregnated** with an acid, e.g., phosphoric **acid** or **sulfuric acid** between layers of the graphite. It is proper to bind this inter-layer compound by mixing with catalyst particles.
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IC ICM H01M004-96

L121 ANSWER 18 OF 18 JAPIO (C) 2004 JPO on STN
ACCESSION NUMBER: 1980-041810 JAPIO
TITLE: CONDITIONING OF CATION EXCHANGE **MEMBRANE**
INVENTOR: KIYOTA TORU; SAKANAKA YASUHIRO
PATENT ASSIGNEE(S): TOYO SODA MFG CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 55041810	A	19800324	Showa	B01J047-12

APPLICATION INFORMATION

STN FORMAT: JP 1978-113672 19780918
ORIGINAL: JP53113672 Showa
PRIORITY APPLN. INFO.: JP 1978-113672 19780918
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1980

AN 1980-041810 JAPIO

AB PURPOSE: To carry out the conditioning of cation exchange **membrane**-A to a cation exchange **membrane**-B comprising partially **polymerizing** the cation exchange **membrane**-A with diene derivative and then head-treating the resulting **membrane** with organic solvent to obtain the **membrane**-B which shows high current efficiency without rising **cell** voltage during **electrolysis**.

CONSTITUTION: One side of **a membrane** consisting of perfluorocarbon polymer having sulfonyl halide group side chain is reacted with an **amine**. The resulting product is treated at an elevated temperature and hydrolyzed to obtain a cation exchange **membrane**-A. This polymeric **membrane** is impregnated with an diene derivative having a carboxyl group and then the **membrane** is partially **polymerized** with said diene derivative having a carboxyl group by means of heating, etc. The resulting partially **polymerized membrane** is impregnated with a water-compatible organic solvent having a boiling point of above 120°C and heat-treated to complete the conditioning to a cation exchange **membrane**-B. When electrolysis is carried out by using the conditioning-completed **membrane**, the diffusion of OH ion from **anode** chamber to chathode chamber is prevented. High current efficiency can be obtaind, through cell voltage is low.

IC ICM B01J047-12
ICS B01J039-08
ICA C08F008-00; C08J005-22

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